

SEISMIC SAFETY & DISASTER READINESS

**CALIFORNIA STATE UNIVERSITY,
LOS ANGELES**

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ABBREVIATIONS

BOT Board of Trustees, The California State University
CCR California Code of Regulations
CPB&G Committee on Campus Planning, Buildings and Grounds, CSU Board of Trustees
CSTI California Specialized Training Institute in San Luis Obispo
CSU California State University
CSULA California State University, Los Angeles
DRP Disaster Recovery Plan
EH&S Environmental Health and Safety
EMEP Earthquake/Major Emergency Preparedness (a CSU task force formed in spring 1985 and disbanded in 1990)
EO Executive Orders from the Chancellor
EOC Emergency Operations Center
EPO Emergency Power Off
FEMA Federal Emergency Management Agency
ICS Incident Command System protocols required by SEMS regulations
IS Information Systems
IRM Information Resource Management, CSULA
OES Office of Emergency Services, State of California - Governor’s Office
PP&D Physical Planning and Development, Chancellor’s Office
PPR Project Peer Review
SEMS Standardized Emergency Management System regulations issued by OES in September 1994
SRB Seismic Review Board of The CSU formed in 1992
UPS Uninterruptible Power Supply

INTRODUCTION

PURPOSE

Our overall audit objective was to furnish an independent appraisal of the seismic safety and disaster readiness functions, to ascertain compliance with established policies and procedures, to determine adequacy of internal controls, and to identify opportunities for operational improvements which would help better achieve goals and objectives.

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

- ▶ necessary seismic retrofitting has been done so facilities meet the relevant building standards in Title 24 of the California Code of Regulations;
- ▶ new construction complies with Board of Trustee policy for seismic peer review (RCPBG 05-93-13);
- ▶ reasonable facility measures for disaster avoidance and prevention have been implemented, e.g., anchoring unsecured furniture and equipment or providing for fire suppression - automatic sprinklers and portable extinguishers;
- ▶ there has been coordinated campuswide planning and preparation for disaster preparedness and response, development and promulgation of sound plans and strategies, and continued vigilance to maintain and update plans;
- ▶ campuses have effective response capabilities to the most probable incidents which may affect the safety of personnel, damage assets, or cause significant business interruption;
- ▶ buildings can be evacuated during disasters/emergencies;
- ▶ reasonable provisions have been made for the availability of equipment, information systems, records, supplies, and trained personnel when needed; and
- ▶ tests/exercises have been conducted to prove plan viability and identify deficiencies or weaknesses in response instructions.

SCOPE AND METHODOLOGY

The review emphasized but was not limited to compliance with state laws, Board of Trustee policy, and Chancellor's Office and campus policies, letters, and directives.

INTRODUCTION

Various campus functions and offices were involved including, for example, facilities management, environmental health and safety, public safety, student health center and computer center. Auxiliary organizations were generally excluded from the audit except for the seismic safety of buildings that they occupy which have been prioritized by CSU's Seismic Review Board for retrofitting.

The 1995/96 and 1996/97 fiscal years were the primary periods reviewed for disaster preparedness and planning. However, other earlier years were also included as needed, in part, because the seismic safety action plan for the system dates back to the Board of Trustees resolution in May 1993.

During the course of the audit, we:

- ▶ interviewed responsible personnel;
- ▶ inspected certain facilities such as the emergency operations center, the computer center, and telephone switching rooms;
- ▶ reviewed various plans and documents;
- ▶ examined emergency equipment and supplies; and
- ▶ tested selected devices and features integral to the campus system for disaster mitigation, preparedness, response and recovery.

BACKGROUND

As indicated in the May 1993 Agenda Item 7 of the Board of Trustees' Committee on Campus Planning Buildings and Grounds, the CSU relies upon the requirements of Title 24 of the California Code of Regulations (CCR) for seismic safety building standards. From a structural standpoint, the CSU has been specifically involved in a seismic retrofitting program since 1992. In the 1992/93 Budget Act, funds were provided for seismic reviews of CSU facilities. In implementing this program, the CSU formed a Seismic Review Board (SRB) which has been active with essentially the same membership since its original formation. The focus of this program has been to identify and mitigate the highest life safety risks. Part of the program has been for the SRB to rank order facilities on the degree of seismic risk, subject the highest risks to further engineering investigation and, if warranted capital outlay retrofit projects. The resolution of the committee in May 1993 (RCPBG 05-93-13) also provided for independent technical peer reviews of the seismic aspects of all construction projects from their design initiation, including both new construction and remodeling.

Appendix I_a of the 7/19/95 Report of the Ad Hoc Committee on Emergency Preparedness contains a recent history of emergency planning in the CSU. This report indicates that much of what is in place within the

INTRODUCTION

CSU at the current time can be traced back to the Task Force on Earthquake/Emergency Preparedness (EMEP) formed in the spring of 1985. The EMEP Task Force was instrumental in development of Executive Order (EO) 524 issued 4/5/88. While this EO is now dated, it is still in effect as systemwide policy.

In April 1994 (approximately three months after the Northridge earthquake), the CSU convened the Ad Hoc Emergency Preparedness Committee. The 7/19/95 report of the committee was circulated to the campuses but not implemented on a systemwide basis.

In September 1994, the governor's Office of Emergency Services issued "new Standardized Emergency Management System (SEMS) regulations with which the CSU and all other state agencies as well as local governments and special districts must comply."

Disaster readiness terminology varies. Disaster is associated with emergency management or emergency operations and sometimes with other terms such as business continuity. One company with a world wide web home page on the Internet (Hannah-Watrous Continuity Strategies) describes the "3 R's" of business continuity planning as readiness, recovery, and restoration as follows:

READINESS

- Disaster Prevention and Avoidance
- Emergency Preparedness
- Corporate-wide Planning
- Business Unit Recovery Planning

RECOVERY

- Incident Management and initial recovery

RESTORATION

- Long-term Business Recovery

OPINION

We visited the California State University, Los Angeles campus from June 19, 1997 to July 30, 1997 and reviewed the seismic safety and disaster readiness functions in effect at that time.

We were unable to determine whether the structural hazards posing the highest life safety risk to the campus had been retrofitted or whether buildings were reevaluated as needed because documents to verify these actions were not made available to us at the time of our audit. For the same reason, we also were unable to conclude that new construction had been subjected to independent technical peer review for seismic aspects. Some actions had been taken to address non-structural hazards, but continued vigilance is

warranted. In addition, specific improvements to environmental controls in the computer center and the main telecommunication switching room are recommended.

While the campus has a central disaster/emergency plan with provisions such as an emergency operations center and integrated team structure as required by the state's Standardized Emergency Management Regulations, it is our opinion that the plan and the degree of preparedness are deficient in several areas. These deficiencies are addressed in both the executive summary below and in the body of the report.

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.

ENVIRONMENTAL AND FACILITY CONTROLS

SEISMIC PEER REVIEW DOCUMENTATION [9]

Seismic peer reviews were not well documented. Complete records reduce risks related to life safety concerns and related liabilities.

FALLING HAZARDS [10]

The campus records were incomplete on mitigation of possible falling hazards and completion of seismic bracing. Documentation of intent to mitigate possible falling hazards reduces the campus exposure to damages and legal liability for injuries.

FIRE AND LIFE SAFETY [10]

A large number of fire and life safety issues identified by the Los Angeles City Fire Marshall had not been mitigated. General disaster readiness would be improved by the mitigation of known fire and life safety issues.

EMERGENCY OPERATIONS CENTER [11]

The current location of the Emergency Operations Center (EOC) is inadequate. Re-locating the EOC to a location less prone to fire and water damage increases the campus' ability to handle disaster situations.

WATER INTRUSION ALARMS [12]

The main telecommunications and data communications equipment room lacked water intrusion detectors. The main computer room had water detectors, but the alarm for these was not activated. In the event of water leakage and intrusion into these areas, water detectors with remote notification alarms would help ensure timely response and reduce the risk of equipment damage and disruption of computer, telecommunications, and data communications operations on campus.

SMOKE DETECTORS [13]

The mechanical and paper storage rooms adjacent to the telecommunications room in the administrative building lacked smoke detectors with remote notification. Installing smoke detectors in these areas ensures that fires starting there are detected before they can spread to other parts of the building such as the telecommunications room.

TELECOMMUNICATIONS ROOM HALON SYSTEM [13]

The telecommunications room Halon fire suppression system is not connected to the building fire alarm system. Tying the Halon system into the building fire alarm system will help ensure that any problem that causes the fire suppression system to activate will be addressed in a timely manner.

DISASTER PLANNING

SEGREGATION OF DUTIES [14]

There was not a proper segregation of emergency duties. The director of public safety is both the emergency operations executive and the EOC director for the campus. Segregation of duties would improve coverage and mitigate against any one individual becoming overburdened in executing assigned responsibilities.

TRAINING [15]

The *Multi-Hazard Emergency Plan* does not provide any specificity on training. Specific training goals identify the type of training, the desired number of hours, and targeted trainees and further demonstrate management's commitment.

VOLUNTEER ORGANIZATIONS [16]

The campus *Multi-Hazard Emergency Plan* does not specifically address how volunteer organizations will be included as part of the campus emergency response. Without specificity within the plan, the campus risks volunteers being placed in a position of unnecessary or inappropriate risk and liability.

IRM DISASTER RISK ANALYSIS [16]

An Information Resource Management (IRM) disaster risk analysis had not been performed. Performing a disaster risk analysis helps ensure that planning efforts are directed at the most likely disaster scenarios affecting the most critical resources and operations of the university.

IRM DISASTER RECOVERY PLAN [17]

The IRM disaster recovery plan (DRP) document lacked some essential components. Incorporating these features into the plan will help ensure the efficiency and effectiveness of disaster response, recovery, and resumption efforts.

ALTERNATE PROCESSING SITE [18]

The IRM DRP did not include a provision for the event that the main computer and/or data communications facilities are destroyed or otherwise unusable. Performing a feasibility and requirements analysis and establishing a provision for an alternate processing site will reduce the amount of time it will take to migrate to an acceptable alternate site should a disaster destroy or otherwise render the existing facilities unusable.

DRP TESTING AND TRAINING [18]

The IRM DRP had not been subject to any scheduled tests or training sessions. Periodic testing and training provides assurances on the feasibility of plan details and the efficiency and timeliness of recovery operations.

PLAN VALIDATION AND MAINTENANCE

VERTICAL EMERGENCY PLANS [19]

Vertical planning documentation is not sufficient to support the overall objectives of the campus

Multi-Hazard Emergency Plan. Integration of plans would assure better support of disaster readiness objectives.

EXERCISING [20]

The breadth and frequency of exercises done by the campus does not involve all elements of the emergency management staff. Involvement of the total emergency management staff would provide opportunities, at formal prescribed intervals, for the campus to document and evaluate the weakness or failures of the existing campus *Multi-Hazard Emergency Plan* and to amend the document as needed.

BUILDING EVACUATION DRILL PROCEDURES [21]

Building evacuation drill procedures were not current. Revising the drill processes and procedures would improve the possibilities for safe evacuation of buildings.

EMERGENCY RESPONSE TESTS [22]

Reporting of emergency response drills and simulations is unclear. Specific procedures on reporting the nature and extent of drills and simulations and their results, including suggested revisions to the campus *Multi-Hazard Emergency Plan*, should be prescribed to keep the plan current and relevant.

ELECTRIC POWER GENERATION [22]

Campus emergency power generation is not sufficient to meet campus needs as stated in their *Multi-Hazard Emergency Plan*. Periodic reassessment of power needs will improve the degree of disaster readiness.

CRITICAL CAMPUS EMERGENCY INFORMATION [23]

The safety of campus occupants and disaster workers is significantly impacted by the lack of availability of critical information. Maintenance of critical campus information within the EOC reduces exposure to foreseeable risks of harm.

DAILY BACKUP OF COMPUTER RECORDS [24]

Daily backups of the mainframe computer and data communication servers were not stored in a secure, remote location on campus. Data communications servers had not been backed up on a consistent basis. Consistent backup procedures and storing backups in a secure location away

from the computer helps ensure that critical data are not lost in the event a disaster destroys the computer or communications equipment.

BACKUP OF VITAL RECORDS [25]

The campus is not backing up and storing off-site “first-class” records in several key areas. Backup of these records is a reasonable precaution against permanent losses.

OBSERVATIONS, RECOMMENDATIONS, AND CAMPUS RESPONSES

ENVIRONMENTAL AND FACILITY CONTROLS

SEISMIC PEER REVIEW DOCUMENTATION

Seismic peer reviews were not well documented.

Seismic peer review engineers were involved with various projects at the campus; however, final reports were not consistently available. These reports are necessary to finalize resolution of design comments and formally document conclusions on the seismic safety of structural retrofitting and new construction projects.

The policy of the CSU since the May 1993 resolution of the Board of Trustee's (BOT) Committee on Campus Planning Buildings and Grounds (RCPBG 05-93-13) has been that independent technical peer reviews of the seismic aspects of all construction projects (both new construction and remodeling) will be performed starting at design initiation to assure conformance with good seismic resistant practices and pertinent provisions of Title 24 of the California Code of Regulations.

Responsibility for monitoring and ensuring compliance with the seismic peer review process and maintaining documentation of this effort was unclear. The nature of the delegation of completed projects to the campus indicates that the campus' need to verify that this process was properly incorporated within building or facility construction and renovation projects.

Incomplete records do not adequately document the mitigation of life/safety risks and related liabilities sought through the seismic peer review program.

Recommendation 1

We recommend that the campus document compliance with the seismic peer review requirements in RCPBG 05-93-13.

Campus Response

Concur. For all current and future construction projects, procedures are now in place whereby Facilities Operations management will ensure that independent technical peer reviews be performed and documented in accordance with the requirements contained RCPBG 05-93-13. For Prior construction projects, we will obtain copies of technical peer reviews maintained by Physical Planning and Development at the Chancellor's.

FALLING HAZARDS

The campus records were incomplete on mitigation of possible falling hazards and completion of seismic bracing.

Page 6 of the campus *Multi-Hazard Emergency Plan* states:

Measures will be taken to reduce the potential impact of known hazards on the campus if feasible.

Campuswide falling hazards were identified in 1993 and, at the time warranted immediate corrective action. Other non-structural hazards also exist due to the absence of seismic bracing. One example existed in the computer center where there was a lack of adequate bracing of the mainframe computer and other tall items.

Facilities Operation had begun to survey campus departments to identify existing non-structural hazards in support of a seismic bracing program. As requested by departments, some bracing had begun. However, the program had not been applied consistently throughout the campus because of limited funding.

Failure to document mitigation of possible falling hazards subjects the campus to increased exposure to damages and legal liability for injuries. In the computer center, critical computer equipment could topple and block evacuation routes.

Recommendation 2

We recommend that the campus develop a system to assure further mitigation of non-structural hazards and completion of appropriate seismic bracing for equipment.

Campus Response

Concur. The University is now conducting a study to identify non-structural hazards and to evaluate and mitigate seismic bracing of equipment. Approximately one-third of identified hazards have been mitigated. The balance will be mitigated as part of the 1998/99 funding program. Full implementation will be complete prior to June 30, 1999.

FIRE AND LIFE SAFETY

A large number of fire and life safety issues identified by the Los Angeles City Fire Marshall had not been mitigated.

Over 165 fire and life safety issues have been identified by the Los Angeles City Fire Marshal during campus inspections. During our audit, we also discovered a previously unidentified fire life safety issue - fire alarms at the child care center and at student housing were not directly connected to Public Safety.

The fire department typically includes the code reference in each citation. Many of their requirements are contained in various sections of Title 19, California Code of Regulations. One of their most significant issues at Los Angeles relates to inadequate evacuation lighting generator systems in six of the larger multi-story buildings on campus. These generators operate on natural gas that will be automatically shut off in the event of a significant earthquake.

The vice president for administration and finance has taken action to fund corrective action to mitigate risk to life issues immediately. According to the director of public safety, the connection of these outlying campus sites has been given a high priority.

Some of the fire and life safety issues have been outstanding since 1994 and impact general disaster readiness.

Recommendation 3

We recommend that the campus continue to eliminate the fire and life safety issues identified.

Campus Response

Concur. The University has undertaken a detailed review of the deficiencies identified and assigned corrective action as appropriate. Items of a scope beyond campus staff capabilities have been assigned to the campus consulting architect and consulting engineer. This recommendation will be implemented by June 30, 1998.

EMERGENCY OPERATIONS CENTER

The current location of the campus Emergency Operations Center (EOC) is inadequate.

The EOC is located within a temporary bungalow that does not contain a fire suppression sprinkler system. Further, this bungalow is within a 100 yards of a multistory water tank, recently completed as part of a campus air conditioning system. In the event of an earthquake or other incident that causes a breach in the water tank, the viability of the EOC can be questioned. Similarly, the EOC is not considered well protected against the risk of fire.

A viable EOC is a critical component of the campus *Multi-Hazard Emergency Plan*. *Executive Order 524 delegates responsibility to the campus for maintaining an effective state of EOC readiness.*

If the EOC were unavailable during an emergency situation, the campus' response to disaster would be inadequate. To address these concerns, a limited capability mobile EOC back-up unit is being constructed as funds become available. However, in the interim, no EOC alternative exists.

Recommendation 4

We recommend that an alternative, permanent site for the EOC be established and that in the interim the mobile EOC be made operational as soon as practical.

Campus Response

Concur. The university is in the process of locating an alternative permanent site for the EOC. A mobile EOC is currently being developed and will be operational by May 1, 1998.

WATER INTRUSION ALARMS

The main telecommunications and data communications equipment room lacked water intrusion detectors. The main computer room had water detectors, but the alarm for these was not activated.

Both rooms are below ground level and are at risk of water intrusion from multiple sources. The manager of data base administration and technology development indicated that the remote notification alarm system had lost power at some time in the past. When it was reprogrammed, the water detectors were inadvertently not set up.

Water intrusion may not be noticed until damage has occurred and operations are disrupted.

Recommendation 5

We recommend that water detectors with a remote notification alarm be installed in the main telecommunications and data communications equipment room and that the alarm for the detectors in the main computer room be reactivated.

Campus Response

Concur. The University's telecommunications switch room is undergoing a complete physical restructuring and reconfiguration, including the installation of interior and exterior drains, sump pump, and a comprehensive remote monitoring system tied into the computer room, with a direct alarm system link to University Police. This recommendation will be implemented by June 30, 1998.

SMOKE DETECTORS

The mechanical and paper storage areas adjacent to the telecommunications room in the administrative building lacked smoke detectors with remote notification.

These areas are at a higher risk of fire and are not normally occupied. The walls separating these areas from the telecommunication room offer limited fire resistance. Fire originating in these rooms could spread to the telecommunications room or the rest of the administration building before authorities could respond. While the telecommunications room itself is protected by an automatic Halon fire suppression system fire will eventually penetrate the room but possibly after the discharged Halon has dispersed.

The lack of smoke detectors in these locations could delay the detection of a fire and the emergency response, resulting in equipment damage and disruption of telecommunications and data communications operations.

Recommendation 6

We recommend that smoke detectors be installed in these rooms and be connected to the building fire alarm system to provide remote notification.

Campus Response

Concur. Smoke detectors will be installed as part of the general campus fire/life safety upgrade program. This recommendation will be implemented by June 30, 1998.

TELECOMMUNICATIONS ROOM HALON SYSTEM

The telecommunications room Halon fire suppression system is not connected to the building fire alarm system.

Although the room is protected by an automatic Halon fire suppression system, if the fire originates outside the room, the fire will eventually penetrate the room after the discharged Halon is

dispersed. If it originates inside the room due to an electrical short or other problem, the fire could restart after the Halon has dispersed.

Authorities may not be informed of the problem until after damage has occurred.

Recommendation 7

We recommend that a remote notification feature be added to the automatic fire suppression system in the telecommunications room such as by connecting the system to the building fire alarm system.

Campus Response

Concur and implemented. The Telecommunications Room fire alarm system is connected to the Administration building's fire alarm system.

DISASTER PLANNING

SEGREGATION OF DUTIES

There was not a proper segregation of emergency duties. The director of public safety is both the emergency operations executive and the EOC director for the campus.

The Emergency Operations Executive and the EOC Director are separately defined within the campus *Multi-Hazard Emergency Plan* (p. 8c). Each of these positions has separate and distinct responsibilities and duties.

These functions are typically segregated at CSU campuses to provide adequate coverage and focus. The most common model is to have the vice president for administration designated as the emergency operations executive and the director of public safety as the EOC director.

According to the campus, these duties were not segregated because of staffing limitations and the degree of confidence in the public safety director.

During a disaster event, the EOC Director is likely to be overburdened by these multiple responsibilities. Further, internal checks and balances over the campus's emergency planning would improve with a separation of duties.

Recommendation 8

We recommend that the campus segregate the duties of Emergency Operations Executive and EOC Director.

Campus Response

Concur. The Director of Public Safety will establish procedures which clearly segregate the duties. This recommendation will be implemented by June 30, 1998.

TRAINING

The *Multi-Hazard Emergency Plan* did not provide any specificity on training.

Page 4 of the campus *Multi-Hazard Emergency Plan* states:

Training and exercising are essential to make emergency operations personnel operationally ready. This emergency plan will include provisions for training.

There is a considerable amount of training for emergency operations personnel, notably in hazardous materials, search and rescue, building evacuation, and public safety. However, the plan does not indicate any goals in terms of what types of training should be provided, how much training, and to whom. Without this specificity, the campus risks having an inadequate number of people trained and in the wrong areas.

Recommendation 9

We recommend that the campus specifically establish appropriate training goals for emergency management personnel.

Campus Response

Concur. The Director of Public Safety will incorporate specifics regarding the training of emergency operations into the campus' Multi-Hazard Emergency Plan. Specifics will include the personnel who are to receive the training, and the type and frequency of training they are to receive. This recommendation will be implemented by June 30, 1998.

VOLUNTEER ORGANIZATIONS

The campus *Multi-Hazard Emergency Plan* did not specifically address how volunteer organizations will be included as part of the campus emergency response. Details as to these persons rights, responsibilities, and liabilities needs to be considered as well as specifics on training, screening and registration (i.e. State Office of Emergency Services registration which provides emergency workers certain immunity to liability under Government Code Section 8657.)

The campus *Multi-Hazard Emergency Plan* (p. 8f-2) states that the EOC will be staffed by a person “appointed by the Director, Public Safety” to control “Volunteer Organizations.” Specifics have not been defined.

The campus currently has two volunteer groups that have been included in disaster training exercises. Without specificity within the plan, the campus risks volunteers being placed in a position of unnecessary or inappropriate risk and liability.

Recommendation 10

We recommend that the campus develop standards as to the rights, responsibilities, and liabilities of volunteers. We further recommend that these standards address their training, screening and registration.

Campus Response

Concur. The Director of Public Safety will identify the individual responsible for volunteer organizations, and will develop the standards recommended by the Auditor. This recommendation will be implemented by June 30, 1998.

IRM DISASTER RISK ANALYSIS

An Information Resource Management (IRM) disaster risk analysis had not been performed for computing, telecommunications, and data communications operations.

A disaster risk analysis identifies and quantifies the probability of various disasters. Without it, there is limited assurance that planning efforts will be expended on the most likely disaster scenarios affecting the most critical resources and operations of the university.

Recommendation 11

We recommend that an IRM risk analysis be performed for computing, telecommunications, and data communications operations.

Campus Response

Concur. See response to Recommendation 12, below.

IRM DISASTER RECOVERY PLAN

The IRM disaster recovery plan (DRP) document lacked some components. These include

- network recovery procedures;
- more detailed mainframe recovery procedures;
- declaration/plan activation criteria; and
- version and copy control.

The DRP was only recently created and these features had not yet been incorporated.

Without adequate technical procedure documentation, recovery and resumption efforts could be unnecessarily delayed. Without a version and copy control process, all copies may not be up-to-date when a disaster strikes. These factors could impede the efficiency and effectiveness of disaster response efforts.

Recommendation 12

We recommend that the IRM DRP be revised to incorporate the above noted components as planned.

Campus Response

Concur. The University is in the process of implementing an automated Disaster Recovery System (DRS) which is a component of the newly-installed IBM ADISM Tape management system. The DRS includes off-site vault management procedures and is an important component of the University's disaster recovery strategy. To this end, we have installed the component of the university's disaster recovery strategy. To this end, we have installed the hardware and software for this system and staff have been trained in its use. We are currently performing the final configuration for this system and will go live by June 30, 1998.

ALTERNATE PROCESSING SITE

The IRM DRP did not include a provision for the event that the main computer and/or data communications facilities are destroyed or otherwise unusable.

The associate vice president for information resources management indicated that he had decided to eventually (within one year) outsource the mainframe system to a third party service or to another campus computing center. He had, therefore, elected not to expend the cost and effort to establish an alternate processing site provision. The DRP recognized this and stated that it will take at least several weeks to recover and resume even the most critical computing services.

Not having performed a feasibility and requirements analysis and established a provision for an alternate processing site will increase the amount of time it will take to migrate to an acceptable alternate site should a disaster destroy or otherwise render the existing facilities unusable.

Recommendation 13

We recommend that feasibility and requirements analysis be performed to provide at least a minimal alternative processing site plan to mitigate the operational disruption from a disaster which disables the main computer and/or data communications facilities.

Campus Response

Concur. A feasibility and requirement analysis of the mainframe has been initiated. To ensure recovery of our client/server environment, we have received verbal commitments from IBM account executives that they have equivalent equipment replacement (new or used) and that this equipment can be delivered to the campus or a designated site within three (3) to four (4) days of a disaster. Once this agreement is obtained in writing, it will be incorporated into our DRP. This recommendation will be implemented by March 31, 1998.

DRP TESTING AND TRAINING

The IRM DRP had not been subject to any scheduled tests or training sessions.

The DRP was only recently created. The associate vice president for information resources management stated that the DRP would be subject to testing and training after it had been finalized.

Without periodic testing and training, the feasibility of recovery plan details and the efficiency and timeliness of recovery operations are not assured.

Recommendation 14

We recommend that the campus establish a DRP testing and training program starting with a walk-through exercise first, a table-top exercise, and then periodic testing of various disaster scenarios as determined by a risk analysis.

Campus Response

Concur. Each of the above-mentioned components will be included in our DRP. This recommendation will be implemented by August 31, 1998.

PLAN VALIDATION AND MAINTENANCE

VERTICAL EMERGENCY PLANS

Vertical planning documentation is not sufficient to support the overall objectives of the campus *Multi-Hazard Emergency Plan*.

The current campus *Multi-Hazard Emergency Plan* is a combination of a campus-wide horizontal plan with a number of vertical plans (e.g., Information Resource Management, Health Center, etc.) subsumed thereunder. The main plan has evolved from a generic multi-hazard functional plan prepared by the EMEP Task Force dating back to the late 1980s. The following was observed with respect to many of these vertical emergency plans prepared by the campus:

- Most vertical plans had not been updated or revised in several years.
- All vertical current plans were not maintained within the EOC.
- Most vertical plans did not clearly integrate into the horizontal campus *Multi-Hazard Emergency Plan*, for example:
 - Evacuation drill procedures describe an Evacuation Assessment Team, however, a description of such leadership is not specifically included within the campus *Multi-Hazard Emergency Plan*.
 - Making and controlling disbursements during an emergency, written vertical plan outdated with respect to controlling check stock and check printing.

Recommendation 15

We recommend that vertical plans should be updated and clearly integrate into the campus *Multi-Hazard Emergency Plan*. We further recommend that copies of vertical plans be maintained within the EOC.

Campus Response

Concur. The Director of Public Safety will obtain all plans and integrate them into the Multi-Hazard Emergency Plan. This recommendation will be implemented by June 30, 1998.

EXERCISING

A campus-wide full-scale test event including all elements of the emergency management staff, including EOC and Evacuation team members has not been completed on a regular basis.

The requirements of Executive Order (EO) 524 for exercising are as follows:

1. exercises (drills or simulation) involving appropriate segments of the campus community must be held at least semi-annually; and
2. every segment of the response organization must participate in at least some element of a total exercise at least once per year; and
3. a campus-wide test event must be conducted at least once every two years.

Section 8 of the California Emergency Plan closely correlates in terminology to EO 524 with definition of a test and three types of exercises. The statewide plan defines a full-scale (a.k.a. total) exercise as follows:

Full-scale exercises simulate an actual emergency. They typically involve complete emergency management staff and are designed to evaluate the operational capability of the emergency management system.

The extent of exercises on the campus is less than contemplated in EO 524 in part because of differing interpretations of what constitutes the response organization.

Less than full-scale exercises at prescribed intervals with involvement of the total emergency management staff does not provide enough opportunities for the campus to document and evaluate the weakness or failures of the existing campus *Multi-Hazard Emergency Plan* and to amend the document as needed.

Recommendation 16

We recommend that the campus perform biennial full-scale exercises according to EO 524.

Campus Response

Concur. The Director of Public Safety will review the components of Executive Order 524 and incorporate them into the university's plan for full-scale emergency testing exercises. This recommendation will be implemented by June 30, 1998.

BUILDING EVACUATION DRILL PROCEDURES

Building evacuation drill procedures were not current.

The campus maintains an evacuation program that includes drills at least three times a year. Evacuation processes and procedures need revision as follows:

- Campus Administrative Procedure 408 "Emergency Action Plan" describes "Building Coordinators" duties, which are in practice the duties of the "Evacuation Coordinators." Procedures need to be revised.
- Campus Administrative Procedure 408 states that coordinators should develop an emergency plan for their assigned building or section and update it quarterly and submit to the EOC Director. These plans are not regularly updated and submitted to the EOC.
- Some coordinators rely on a generic evacuation plan as opposed to a site-specific plan which identifies responsible persons, unique aspects of escape routes, etc. as required by Administrative Procedure 408.
- Campus-wide evacuation drills do not always include the outlying campus locations, such as Student Housing.

Processes should be revised to meet documented procedures. Written procedures should be revised to reflect changes in processes and personnel. Safe evacuation of campus buildings during an emergency requires such planning.

Recommendation 17

We recommend that: the campus update Administrative Procedure 408 to reflect practice; written site-specific evacuation procedures be completed for all campus locations; and all evacuation procedures be updated regularly and submitted to the EOC.

Campus Response

Concur. The Director of Public Safety will amend Administrative Procedure 408 in order to incorporate each of the issues cited by the Auditor. This recommendation will be implemented by June 30, 1998.

EMERGENCY RESPONSE TESTS

Reporting of emergency response drills and simulations is unclear.

Current reporting varied from a formal report prepared by an outside consultant submitted to the Chief of Public Safety to a brief memo to a campus vice-president. Specifics on reporting the nature and extent of drills and simulations and their results, including suggested revisions to the campus *Multi-Hazard Emergency Plan* should be prescribed. The same holds for to whom such reporting should be directed and distributed.

Executive Order 524 requires the campus to maintain summary records of each emergency response test event with particular emphasis on documentation of weaknesses or failures in existing planning and the development of appropriate proposals for amending plan documents.

Without specific procedures, exercises and test results might not be documented in consistent detail. And, if these results are not similarly appropriately distributed, necessary corrective actions might not be taken to enhance the campus *Multi-Hazard Emergency Plan*.

Recommendation 18

We recommend that the campus enhance and standardize reporting on exercises consistent with EO 524 requirements.

Campus Response

Concur. The Director of Public Safety will develop a mechanism consistent with EO 524 that would require reporting from appropriate areas within the University. This recommendation will be implemented by June 30, 1998.

ELECTRIC POWER GENERATION

Campus emergency electric power generation is not sufficient to meet campus needs as stated in their *Multi-Hazard Emergency Plan*.

The campus *Multi-Hazard Emergency Plan*'s stated objective (p. 4) is to be prepared to "stand alone for a significant period of time (e.g., 72 hours).

We found the following:

- The Health Center, a critical component of the campus planned emergency response program, has less than a one-hour generator currently in place;

- Short-term and long-term emergency generator fuel reserve requirements, estimating the power needs for the EOC and other critical campus emergency functions has not occurred.
- Power cut-over tests for the campus communication system computer room and the EOC, as part of preparedness drills and simulations, has not occurred.

Both the director of the health center and the chief of police indicated that some emergency power capabilities have not been implemented because of funding considerations. In addition, scheduling of tests has to be timed so as not to interrupt critical services.

Planning for and maintaining an adequate emergency power generation system is a critical component of the campus' emergency preparedness. Without some testing under loads, there is less assurance that generators will operate reliably.

Recommendation 19

We recommend that campus management:

- a. Reassess emergency power generator placement;
- b. Assess and then plan for short-term and long term emergency generator fuel needs; and
- c. Include occasional power cut-over tests for the communication system computer room and the EOC.

Campus Response

Concur. Each of the informational items noted in the condition of this finding will be maintained within the EOC. This recommendation will be implemented by June 30, 1998.

CRITICAL CAMPUS EMERGENCY INFORMATION

The safety of campus occupants and disaster workers is significantly impacted by the lack of availability of critical campus information within the EOC.

The following information was not maintained within the EOC:

- Current comprehensive maps of the campus including locations of hazards (chemical, biological, radiological), utility shut-offs, power and water supplies, animals and reptiles, machine rooms, alarms, and other facility oriented information required by the Fire Marshal.
- Updated inventories of hazardous materials maintained on campus as required by the California code of Regulations.
- An inventory listing of emergency supplies and equipment, including precise location information, which could be critical in the event of an extensive campus-wide disaster.

- Current listings of student and employee locations, such as class schedules, which could be critical to rescue operations.

Individuals might be unnecessarily exposed to foreseeable risks of harm, if the above critical campus emergency information is not available to emergency situation management.

Recommendation 20

We recommend that the campus take appropriate steps to ensure that the above noted information be maintained within the EOC.

Campus Response

Concur. Each of the informational items noted in the condition of this finding will be maintained within the EOC. This recommendation will be implemented by June 30, 1998.

DAILY BACKUP OF COMPUTER RECORDS

Daily backups of the mainframe computer and data communication servers were not stored in a secure, remote location on campus. We also noted that data communications servers had not been backed up on a consistent basis.

The manager of data base administration and technology development indicated that IRM plans to implement an automated backup procedure for the servers and to store all IRM daily backup tapes in a fire-proof safe in another campus building.

In the event of a disaster, up to one week of transactions entered into and processed by the mainframe computer could be permanently lost or need to be recreated at a significant cost in time and effort. This would disrupt campus operations.

Recommendation 21

We recommend that that the campus ensures that daily backups are consistently processed and stored securely in an area away from the computer room.

Campus Response

Concur. A new fireproof vault has been installed in another building on campus to securely store all daily backups. As noted in the response to Recommendation 12, we have installed new high-speed tape drives and are in the process of implementing IBM's ADSM (Adstar Distributed Storage Manager), which includes the disaster recovery module, to automate all server backups, thus

eliminating the potential errors caused by maintaining manual logs and significantly enhancing off-site management and media recovery.

BACKUP OF VITAL RECORDS

The campus is not backing up and storing off-site “first-class” records in several key areas.

No vital records, except main frame computer data, were being backed up and stored off-site, including employee personnel files, signed contracts, etc. Campus building floor plans and mechanical drawings were maintained in a temporary building without a fire suppression system.

Enclosure 8 to the campus *Multi-Hazard Emergency Plan* (p.47) addresses vital record protection through definition of first-class records (irreplaceable/cannot be reconstructed) and policy provisions that state:

All records classified as “first-class” shall be duplicated (preferably microfilmed) and stored at an off-site location known by the university administration.

If a disaster should destroy the area of the building where the primary records, backup copies, and source documents are stored, the records may be permanently lost or may not be easily recreated in a timely manner. This could disrupt campus operations.

Recommendation 22

We recommend that the campus backup and store off-site all vital records.

Campus Response

Concur. The Vice President for Administration and Finance will review the portion of the Multi-Hazard Emergency Plan addressing “first class” record storage and develop a plan for implementation by June 30, 1998.

APPENDIX A: PERSONNEL CONTACTED

<u>Name</u>	<u>Title</u>
Steven N. Garcia	Vice President for Administration and Finance
Jacqueline Avery	Assistant to VP for Administration and Finance, Financial Management Services
Mark Canevari	Internal Auditor for Administration
Lillian Colores	Director of Purchasing and Contracts Office
Jim Corsar	Construction Engineer for Project Planning and Development
Connie A. Diggs	Director of Student Health Center
William T. Gaffney	Assistant Director of Human Resource Management and Risk Manager
Ray Gartsman	Construction Project Manager and Inspector
Silvia Gonzalez	Manager of Human Resources for Division of Human Resources Management
Maria Gutierrez	Coordinator of Volunteer Emergency Response Team
Thomas A. Huber	Manager of Data Base Administration and Technology Development
Pam Kisor	Director of Child Care Center
Gerald Lipson	Director of Public Safety
Jessie Lum	Business Systems Manager for Business Systems Office
Timothy Matonak	Environmental Health and Safety Officer
David McNutt	Director of Public Affairs
Sal Membreno	Director of Animal Care and Biological Hazards
Robert Pure	Auto Shop Supervisor for Facilities Planning and Management
Peter P. Quan	Associate Vice President for Information Resources Management
Robert Schulz	Principal Architect for Physical Planning and Development
Raquel Soriano	Director of Auxiliary Services Enterprise
Denzil Suite	Director of Residence Life and Housing Services
Roshni Thomas	Assistant to VP for Administration and Finance, Facilities Planning and Management
Glenn Venner	Assistant Director of Facilities Planning and Management
Angela Warren	Purchasing Agent for Purchasing and Contracts Office
Andrew Winnick	Associate Vice President for Academic Affairs