UC Berkeley Research Recovery Action Plan

Prepared for the SAFER Program

by the

Research Seismic Recovery Work Group,
Office of the Vice Chancellor-Research

April 14, 2004

Research Seismic Recovery Work Group

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The Academic Senate Disaster Preparedness Work Group assisted in developing Appendices A, C and E.

The Facilities Reocccupation Group, part of the campus Business Resumption Coordination Group, developed Appendix G.

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Section I. Purpose of the Plan

Research is a significant part of the UC Berkeley mission. There are both individual and institutional responsibilities to ensure timely resumption of research activities after a disaster. The planning goal articulated in the ***UC Berkeley Business Resumption Plan*** is to have the university open for business within 30 days of an earthquake or other major disaster. A longer closure would seriously compromise our capacity to carry out our research mission.

This report details the steps—and the responsible office for each—that must be taken before a major disaster to ensure that campus facilities will be adequate to support the students, faculty and staff who sustain the excellence of Berkeley's research. Every member of the campus community has some role in protecting the investment of human and financial capital in our research programs. Maintenance and recovery of research at Berkeley will depend on the strength of our preparedness plan, particularly in the areas of authority and decision-making, communications, training for key personnel, and protection of research materials, information systems and data.

Also described in this report are policies and procedures for operating after a disaster. Some researchers can work only in laboratories equipped with specialized equipment and materials; others are able to work in numerous locations if they have computers, access to data and connectivity. Without carefully developed and widely agreed-upon plans and criteria for making recovery decisions, research resumption at UCB will be delayed. This plan recommends the adoption now of guiding principles for operational decisions that will be made after a disaster by an executive group with input from deans, department chairs and ORU directors. Decision criteria should be vetted at the campus, department and ORU levels, and adopted as soon as possible.

This plan is one of four developed as part of the UC Berkeley Seismic Action Plan for Facilities Enhancement and Renewal (the SAFER Program): The ***Classroom Seismic Recovery Plan***; the ***Utilities Infrastructure Seismic Response and Recovery Report***; and the ***Business Resumption Plan,*** completed in 2001. All provide an assessment of campus vulnerabilities to a damaging earthquake and recommend actions to reduce losses. The overall efficacy of this recovery plan depends on the capacity of each research unit and department to do what is outlined herein. Each of those entities must give thought and time to its own plan, within the framework of the ***Business Resumption Plan*** (see *http:// obr.berkeley.edu*) and with the assistance of the campus Business Resumption Coordinator and the Office of the Vice Chancellor-Research.

Pre-Disaster Responsibilities

1) **University Administration**
   The Chancellor, Executive Vice Chancellor and Provost, and Vice Chancellor-Research are responsible for laying the necessary groundwork to provide UCB maximum capacity to resume research. Included in this are the following:

   - Engaging in business resumption planning, and encouraging or requiring others to do so

- Ensuring that plans are exercised regularly and updated appropriately
- Deciding on criteria to guide decisions on research restoration with limited space and support facilities
- Funding needed improvements to central campus voice and data communications
- Funding steps to strengthen other critical infrastructure such as electrical power or back-up generators
- Supporting other loss-reduction activities such as nonstructural hazard mitigation in labs, libraries, and museums, and data back-up
- Communicating regularly with researchers and the campus community about risk management and loss reduction.

2) Deans, Department Chairs and ORU Directors

- Developing and communicating business resumption plans and procedures for their units
- Including in every job description a clear description of post-disaster roles, responsibilities and expectations and ensuring that each employee understands them
- Exercising and updating the plans regularly
- Protecting departmental servers, computing capacity and network connectivity, and encouraging individual researchers to protect their data
- Annually reviewing criteria for allocating limited space for research after a disaster
- Ensuring that sufficient back-up power is available to their unit(s) to prevent unnecessary losses of research materials and data
- Supporting and encouraging other loss reduction activities such as nonstructural hazard mitigation and data back-up.

3) Principal Investigators

- Protecting their equipment and research material through nonstructural hazard mitigation
- Protecting their computers against damage and data loss, and backing up their data regularly.
- Encouraging their students to protect equipment and material, and to back up data.
- Conducting an annual review to determine what would be required to continue their research in the wake of a damaging earthquake, and taking steps to prepare for such an event.
- If it is feasible to temporarily relocate research activities and students to the labs of collaborators elsewhere in order to keep working, the arrangements should be made now.

Post-Disaster Responsibilities

1) University Administration

- Damage assessment of research facilities: decisions about what is open and what is closed—Facilities Services (FS); Environment, Health & Safety (EH&S); UC Police Department.
- Security: restricting access into damaged buildings—UC Police Department.
- Space management: Facilities Services-Space Management will keep track of repair progress on every building and communicate it to all relevant parties.
- Space allocation and repair priorities—VC-Research Recovery Advisory Group, advising the Chancellor, with input from FS, EH&S.
- Restoration of electronic/voice communications, and computing capacity to normal levels—Information Systems & Technology (IS&T), Facilities Services-Physical Plant, units with servers, and departmental computer support personnel.
- Communication between and among research departments and the campus executive decision-makers--VC-Research
- Animal welfare--the Committee for Animal Research Space Allocation (CARSA), the Animal Care and Use Committee (ACUC), and EH&S will advise the Director of the Office of Laboratory Animal Care (OLAC) on space issues. VC-R and OLAC will work with Space Management and SACI on animal space.
- Extramural funding: the Sponsored Projects Office will work with the campus principal investigators and the funding agencies to continue or restore the flow of research funds to the campus and secure additional funding, where possible, to pay for research resumption costs.
- Public relations--Public Affairs will have responsibility and authority for campus-wide information dissemination and public announcements.

2) Deans, Department Chairs and ORU Directors

- Deans, ORU directors, and department chairs will implement recovery plans and procedures for their units.
- Deans will be the primary contact with department chairs to set priorities for space allocations for specific research programs.
- Deans will be the primary contact with the VC-R in recommending priorities for researcher occupation of useable space.
- Department chairs and ORU directors will work with PIs to assess their ability to continue projects with available resources.
- Department chairs and ORU directors will be the primary contact with the dean for all space requests for research.

3) Principal Investigators

- PIs will notify their deans, department chairs and ORU directors of their ability to continue research, and submit to them specific requests for space, material or resources

- PIs will contact program officers and funding organizations about availability of funds and terms of their use.
- PIs will inform SPO about availability of funds and planned activities.
- Principal investigators will work with compliance offices to determine how protocols can be modified, if necessary.

Section II. Potential Disaster Impacts on UCB

An earthquake on the Hayward fault, a fire in the hills, or a hazardous materials incident will affect the Berkeley campus' ability to carry on research both directly and indirectly. An earthquake presents the most extensive threat, but each hazard will cause some degree of damage to people, animals, buildings, building contents, utility systems--on and off campus--and transportation. While the first challenge on campus will be search, rescue, and emergency medical care for people, very shortly thereafter it will be necessary to assess damages to facilities and begin to secure research animals, spaces, activities, data, and communication networks. Deliveries of supplies may be interrupted. Employees may find it difficult to come to work. Some buildings will suffer serious structural damage; others will be minimally affected; in many, irreplaceable materials or expensive equipment will be lost. All buildings will be closed initially to allow for inspections; subsequently, many could be closed for repairs, whether minor or major.

Vulnerabilities within the UCB Research Program

Research on the UCB campus represents a substantial part of both our income and our physical space. Of the over $440 million in 2002-2003 research awards to UCB, 70% of the work takes place on the central campus, and approximately 26% of this research is dependent on functioning wet laboratories. Nearly half of the 36 buildings that house our 25 major research units were rated "poor" in the SAFER engineering study of 1997. The "poor" rating indicates buildings that are expected to sustain extensive structural and nonstructural damages likely to injure building occupants. These buildings have been assigned very high priorities for structural strengthening.

Beyond basic concerns for life safety, we must consider the extent to which research buildings will be damaged and how quickly they can be repaired. The poor and very poor buildings will certainly require major repairs which could take months to perform if both structural and nonstructural conditions are not addressed in advance. Professor Comerio's 2000 loss estimation study of the campus (***The Economic Benefits of a Disaster-Resistant University***, IURD Working Paper 200-02) suggests that, in a magnitude 7 quake on the Hayward fault, 21 of these 36 buildings could sustain significant damage that would require up to two years for repair before reopening. It is imperative that we plan ahead to minimize the impact of such events.

Even research space in structurally sound buildings may be subject to extensive nonstructural damages, i.e. the structures will resist major damage, but the contents will be thrown about. Unbraced bookcases and file cabinets are vulnerable to tipping. Refrigerators and freezers may tip or move, and the doors may open and spill their valuable and sometimes hazardous contents onto the floor. Unfastened desktop equipment and computers will slide, fall or fly, possibly cause injuries, and assuredly cause damages. Chemicals and other hazardous materials not safely stored in latched cabinets will fall over and cause acutely hazardous releases, extensive contamination, and/or fires.

The 1998 UCB ***Utilities Infrastructure Seismic Response and Recovery Report*** indicates that campus utility systems are very vulnerable to damage and disruption. If power or water are

interrupted, that will affect many or all campus buildings, rendering them--whether they're damaged or not--unusable until the utility is operational again.

Object Lessons

To highlight the potential effects of an earthquake on a research university, we briefly review the experiences of various universities and research hospitals in recent disasters: UCI and UCSC lab fires in 2001 and 2002; Texas Medical Center in flooding in June, 2001; University of Washington in the earthquake of February, 2001; Columbia University in the power outage of summer, 1999, and California State Northridge University in the January, 1994 earthquake.

1) Lab Fires at UCI and UCSC
A frequent secondary consequence of earthquakes is fires. Recently there have been two serious laboratory fires within the UC system that provide a glimpse of their potential impacts on research. In July of 2001 at UC Irvine a solvent distillation fire destroyed one large chemistry lab and caused $3.5 million in damage. Research in Reines Hall was stopped for five days. The responders were required to carry cylinders of compressed breathing air. Assistance in cleanup was obtained from multiple contractors. Reoccupancy of the building was allowed only after extensive air sampling and analysis.

A January, 2002 fire at the UC Santa Cruz campus destroyed two molecular biology labs. The fire cause was never identified. The cost was estimated at $5 million, not including the value of the refrigerated research material lost when the building power was turned off. Nor does the estimate include the cost of restarting interrupted research. The building was closed to researchers for six weeks, with some research not starting up for more than ten weeks. Much of the damage to research was in rooms far from the fire, but affected by smoke or the water from fighting the fire. A molecular biology professor reported the recovery process as, "chaos and disorganization."

2) Texas Medical Center, June, 2001
Torrential rains associated with a hurricane overwhelmed the urban drainage system in Houston and flooded the campus of the Texas Medical Center, a complex of 14 university hospital and research facilities. Basements and first floors were flooded. Structures were damaged and laboratories were destroyed. An underground laboratory animal care structure was flooded and contaminated with sewage, and 40,000 animals were killed. Upon hearing that their genetically engineered mice were drowned in the sewage-contaminated flood waters in the completely inundated animal care facility, some researchers attempted to enter flooded buildings wearing personal scuba diving equipment, so desperate were they to retrieve tissue from the dead animals. The estimated damage to the Medical Center is set at $2 billion dollars. Research was interrupted for months. NIH and NSF have given individual researchers and some of the affected universities grants to replace equipment and the animal care facility, but that will take time.

3) University of Washington, February, 2001
A magnitude 6.8 earthquake rattled Seattle in early February, 2001, causing damage to University of Washington libraries, utility tunnels, and a few buildings. The earthquake did not

produce the damage expected at M6.8 because it was centered 30 miles below the earth's surface, extremely deep compared with the 9-12 mile depth expected in the Bay Area. In the libraries numerous shelves buckled and disgorged their contents onto the floor. The damaged shelving had to be replaced, which closed some libraries for weeks--at the end of Winter Quarter and during finals. The Health Sciences Building suffered asbestos contamination and damage to contents and some areas had to be closed for inspection and clean-up. Special arrangements had to be made in order to allow researchers inside to feed their cell lines. Witnesses in parts of the building reported flasks and other lab equipment "flying off shelves and work benches." Fish tanks that had been properly restrained, however, suffered little damage. Utility tunnels on the campus were contaminated with asbestos and its cleanup delayed utility repairs for days.

4) Columbia University, July, 1999
The disaster at Columbia resulted from a sustained power outage due to excessive power consumption during a heat wave. The electricity went out and was not completely restored for two or three days. In the intervening time, researchers at Columbia's College of Physicians and Surgeons lost untold research materials--human tissue, enzymes and cells--because there were not sufficient back-up generators to keep freezers or incubators running. Damages to the $200 million research program were roughly calculated at many millions of dollars. Columbia-Presbyterian Medical Center struggled with limited power due to malfunctioning generators. Without the ability to use electricity-dependent equipment, the conditions under which the personnel worked were described as similar to those in developing countries.

5) California State University, Northridge, January, 1994
The magnitude 6.9 Northridge earthquake caused structural damage to every building on the CSUN campus, and interrupted electricity, water, gas and most phone communication. Almost immediately, a fire started in the chemistry building when research equipment was damaged, which lead to a mixing of reagents. Three separate fires burned for a number of hours. The data and materials in the labs were destroyed. In labs where there were no fires, there was nonetheless extensive damage to materials and equipment. Asbestos and other hazardous materials releases required closure of a number of buildings. The main campus library had dramatic damage, and wasn’t useable for over a year.

Every building on campus was damaged to some extent and all had to be closed for inspection. Assessing the nature of the damages proved to be complicated not only by the scale of the disaster, but also by the frequent aftershocks in the first two weeks after the quake. Just when all buildings had been surveyed and rated, a strong aftershock would compel officials to keep the buildings closed and start their surveys all over again. Faculty members were not allowed back in most classroom, lab or office buildings for weeks; some buildings were not accessible at all until they were decontaminated by professional hazardous materials teams or demolished.

Section III. Pre-Disaster Concerns and Responsibilities

A. Life Safety

Preserving the health and safety of all people who work at UC Berkeley is our first priority. Responsibility for ensuring safety rests at many levels: the Chancellor and Vice Chancellors, deans and department chairs, instructors in classrooms and research directors in labs. Clearly, there are both individual and institutional responsibilities for safety on the campus.

1) Administration
The Chancellor and his officers are doing everything possible, within the constraints of time and money, to retrofit all buildings ranked "poor" and "very poor" in the 1997 SAFER survey. A number of buildings have been upgraded to "good" in recent years and some buildings are currently undergoing improvement, but others remain on the "poor" list.

Life safety is also affected by a building's contents—a category of hazards referred to as nonstructural. We must increase our efforts to anchor, bolt, brace and secure furniture, lights, equipment, and appliances. This must be a cooperative project of the administration and the occupants of each building (see item C below).

We must also make every effort to increase the likelihood that campus buildings will continue to function after an earthquake. It is the Chancellor's policy that, if funding allows, new research space be constructed to a higher-than-code level to provide for sustainable operations. Above-code provisions are made for nonstructural elements as well. When buildings are retrofitted, the administration and the building occupants have an opportunity to raise additional funds to pay for above-code improvements.

2) Deans, Department Chairs, Directors
Deans, directors, department chairs, faculty members, and research staff must be familiar with their building's ***Emergency Plan*** and its emergency procedures. State of California regulations specify that PIs, in their role of research supervisors, share responsibility for the safety of those working for them. All responsible should work with the Department Safety Coordinator and Building Coordinator to review or establish protocols to insure the well-being of personnel in the event of an emergency or disaster. Efforts to support and encourage anchoring, bolting, bracing and securing furniture, lights, equipment, and appliances will improve the life safety and the usability of each building.

3) Principal Investigators
Individual researchers should be mindful of the safety and security of their students, employees and associates. Regular periodic self-inspections and safety reviews should be the practice of every department and ORU. The "Preparedness Checklist for Researchers" (Appendix A) will assist campus researchers in identifying and reducing the vulnerability of their offices. PIs are ultimately responsible for anchoring, bolting, bracing and securing furniture, equipment, and appliances in order to protect the life safety of those in their labs and offices.

B. Computer Systems and Data

Although the central campus computing system is moving from Evans Hall to a much more seismically safe building, the campus network has various weak links that an earthquake will most certainly damage to some extent. On the departmental and ORU level, servers, clusters, and workstations are vulnerable to viruses, hackers, and disasters. Though Central Computing Services backs up critical data daily, the amount of back-up by departments and individual researchers is disturbingly small. Roughly 95% of all computing used to support research at UCB is vulnerable to damage and interruption.

1) Central Administration
With the Chancellor's support, IS&T is moving its computer center and improving its business resumption capacity. The Q-Brace Program has provided matching funding and guidance for computer anchoring.

2) Deans, Department Chairs, Directors
Departments and individual researchers can do little to rectify the shortcomings of the campus network or central computing facility, but they can do much to protect their hard drives and work stations. Departments and ORUs manage hundreds of servers, hard drives and local networks that can be damaged, which will also interrupt computing and connectivity. Cheap and effective anchoring devices will prevent servers and hard drives from toppling over and losing or "misplacing" data.

Improved data back-up is an important goal for departments, ORUs, and individual researchers. To encourage back-up of research data, all departments and units should establish local procedures to back-up data often and store it off campus in fire-safe facilities. Researchers can use the back-up services provided by IS&T: "UCBackup" for workstations, and "Offsite Storage Service" for individual computers (see Appendix B). Redundant back-up is the safest strategy, if funds allow for that. The Offsite Storage Service stores printed materials as well as computer disks.

3) Principal Investigators
A researcher's own office and server generally represents his or her greatest risk. Anchoring and data back-up costs can be considered a normal business expense. Many grants allow such expenses to be paid for from direct costs.

C. Research Materials

UCB has an aggressive program of strengthening structurally weak buildings, but the identification and reduction of nonstructural (content) hazards is largely the responsibility of individual departments and ORUs. Increased nonstructural hazard mitigation is crucial to protect research materials, equipment, specimen collections, notes, and other irreplaceable items. Because repair of specialized lab equipment will cost millions of dollars and take much valuable time, critical equipment and materials should be prevented from falling, sliding, flying or rolling. Facilities Managers and PIs should work conscientiously to reduce nonstructural hazards and protect irreplaceable research material. In the spring of 2003, the Q-Brace Program provided

special training in best practices for anchoring and bracing research equipment and lab contents. Guidance for these practices is available to all campus units that do nonstructural work.

Specialized emergency utility back-up systems must be adequate and functional. Routine checks should be conducted to keep them in operating condition, including regular testing of generators and monitoring of fuel supplies. Campus units must arrange for emergency delivery of dry ice and other materials needed to protect fragile research material. De-ionized and other treated water systems may break, so there should be local redundancy (smaller purifiers) as well as vendor agreements for expedited repairs and equipment replacement.

The campus can archive valuable materials: the CCS Offsite Storage Service stores printed materials as well as computer disks.

A checklist to assist in ranking the importance of data, material and equipment safety is included in this report as Appendix C. This should be used by PIs to help prioritize actions to prevent losses.

D. Laboratory Animals

The Office of Laboratory Animal Care (OLAC) has a comprehensive Emergency Plan. Emergency power is provided to all campus animal facilities by secondary generators. System failure alarms for the heating, ventilation and air conditioning for animal facility space are automatically directed to the Police Department or to Facilities Services. Stored animal food and water supply are adequate for about five days. The veterinary staff will enter the damaged facilities as allowed, will assess the situation and make decisions about animal disposition in conjunction with the authorities based upon health, safety and necessity. Should conditions become less than acceptable for humane care of the animals, they will be euthanized according to accepted practice. Researchers should be reminded that they may not remove any animal from its cage or from an animal facility. The OLAC plan is included as Appendix D.

Because OLAC does not care for invertebrates, researchers who use them in their research should be aware of the vulnerability. Loss of power in an earthquake could be disastrous, especially for aquatic organisms, as aeration pumps and filters may be knocked off-line. Once off, they can not recover without hands-on attention. Scientists who use invertebrates should have contingency plans to guard against losing all their research organisms.

E. Museum Collections

Mitigation of structural and nonstructural risks is especially important for protecting museum collections since most artifacts and specimens are unique and irreplaceable. Loss of museum collections represents a high financial risk; the 2000 Comerio study revealed that 16% of the total value of campus contents is in museum collections. UCB's collections would cost billions of dollars to replace--if replacements were available on the market. Normal preventive and recovery measures such as storage of duplicates off-site, back-up copies, and relocation to alternative sites are not typically considered viable options for museum collections. The Phoebe Hearst Museum of Anthropology has begun a project to move much of its valuable artifact

collection out of the Hearst Gym basement and into safer, atmosphere-controlled space at 6701 San Pablo. The Bancroft Library is also moving some vulnerable film archives to the San Pablo space.

F. Information

The responsibility to design and deliver information to PIs and all researchers lies within the purview of the Office of the VC-Research, with assistance and cooperation of other offices such as SPO. This is not a large undertaking, but it must be a regular one. Deans, directors and department chairs can assist in communicating critical preparedness and mitigation information to all faculty members.

To change the risk-taking behavior of many researchers will require a steady flow of information in many formats and through all media. Researchers need reminders, scenarios, checklists, demonstrations, peer pressure, and persuasion in order to make security and loss reduction a regular part of their modus operandi. Researchers new to UCB need to know that the veteran researchers follow these procedures. Veterans need to know that their respected colleagues do so. They all need to know that no prudent researcher would do otherwise.

Clearly, there are many avenues for communication and much information already available in various formats. The checklist in Appendix A is one such information piece that can be disseminated frequently and widely. As can the data back-up information in Appendix B, and the lab vulnerability survey in Appendix C. After the first information push, researchers must then be reminded regularly of the risks and the mitigations.

A funded nonstructural loss reduction program for research facilities, whether it's an expansion of the Q-Brace Program or not, can be promoted in much the same fashion the Q-Brace has been. An ongoing program will need a web page and personnel responsible for administering it, and will need to be negotiated with EH&S, current home of Q-Brace. Both specific and general information can flow through the EH&S website and the special research website, as well as through other campus media such as e-mails, the ***Berkeleyan***, and departmental newsletters.

All researchers must be informed about plans and procedures for reoccupying buildings after an earthquake, reallocating limited research space, and assigning employees to business resumption activities. The responsibility for that should be shared among the VC-Research, the Business Resumption Coordination Group, and deans, directors and department chairs.

The Academic Senate Disaster Preparedness Work Group has developed a set of materials that department chairs can use to plan for instruction and research resumption following a disaster. Department chairs are responsible for developing departmental phone trees and other post-disaster communication procedures. As information about reoccupying buildings and resuming instruction and research becomes available from the EOC and the Chancellor's Policy Group, it will need to be gotten out to all faculty and staff in each department. See Appendix F for suggestions.

G. Business Resumption Planning

The campus ***Business Resumption Plan*** lays out the procedures for efficient business resumption. Special measures will be necessary to accommodate the needs of researchers. The more smoothly such measures work, the better UCB will be able to retain faculty, researchers and students following a damaging earthquake.

Comprehensive personnel policies and procedures are set forth in Section III of the ***UC Berkeley Business Resumption Plan*** (see *http://obr.berkeley.edu*). The material in Sections 1-3 below is *adapted from* that plan.

1) Getting People Back to Work

a) Business Resumption Teams

A division of labor is essential for the success of business resumption. The campus-wide system proposed depends on defining three personnel teams: 1) those that are expected to respond to the emergency and report immediately (A Team--should already be designated in every department); 2) those that are expected to report 2-3 days after the disaster in order to begin business recovery operations (B Team--will include senior management of each department); and 3) those that will be asked to remain away from campus (or leave) until the situation has settled and sufficient facilities are available (Team C).

Unit managers must routinely assign the roles and responsibilities for each position, and arrange training for all faculty and staff in business resumption planning. This should be the responsibility of the department manager or personnel manager who would work with the campus Business Resumption Coordinator to develop assignments and training plans. This information should be part of new employee orientations and regular briefings of faculty members and research directors. Checklists describing procedures for each position will be made available by the campus Business Resumption Coordinator as the planning process evolves.

b) Personnel Notification

General information about university business resumption will be communicated through a number of media. In addition to UCB's current ability to inform the campus community through KALX (90.7FM), the Offices of Emergency Preparedness and Public Affairs will make formal arrangements with at least one AM radio station and other local radio and TV media to provide information to a broad area of the Bay Area.

Information will also be posted on the University's homepage and shadow homepage [http:// *Emergency.Berkeley.Edu*] so people with web access from home can obtain updates. Updated informational recordings will also be accessible through an emergency 800 number: 1-800-705-9998. The Public Affairs Office will work with IS&T to post accurate information about plans and requirements for employee return, with input from the EOC or the Business Resumption Coordination Group.

Each department should develop and maintain a contact list to ensure that key individuals will be informed of the progress of the recovery effort. Departments should annually inform faculty,

students and staff of team assignments and communications plans. Appendix F contains a sample checklist for guiding the creation of a departmental contact system.

c) Personnel Assignments and Redeployment

Faculty and lecturers will be asked not to return to campus until they are informed by department chairs and the classroom assignment coordinator about whether their classes will resume and, if so, where. Exchange professors should return to their home campuses and UCB faculty temporarily working elsewhere may need to remain there.

For displaced work study students and students in academic titles for whom fees are covered, an attempt will be made to provide alternate work if their normal assignments are not available due to building failures, clean-up or suspension of research programs. The ***Business Resumption Plan*** recommends that GSRs have their fees waived whether alternate work is found or not.

Where possible, PIs are expected to make arrangements before an emergency to allow for their graduate students, post-docs, and laboratory personnel to continue the research with colleagues at other institutions (see Appendix A). As part of each unit's business recovery plan, it should specify which categories of laboratory personnel can and should be relocated: SRAs, lab assistants, etc.

PIs should be aware that layoffs or other changes of employment status for career researchers, post-docs, non-academic staff and GSRs must be made in accordance with collective bargaining agreements and University policy. The administering unit will be notified of any policy changes after a seismic event and will carry out personnel actions accordingly.

d) Work Space

Following a major disaster, it is anticipated that many key research facilities will not be open to support research. For this reason, researchers who have wet labs in damaged buildings will have to relocate to another laboratory, find suitable space on campuses nearby, or cease research for some period of time. It is anticipated that researchers will be able to draw upon their contracts and grants to cover travel and lodging fees associated with relocation to other labs.

The Sponsored Projects Office Proposal Review Form will be revised to include language qualifying the responsibility of UCB to provide research space when circumstances are beyond its control.

Emeriti will be asked to relinquish space to active faculty members who are teaching or doing research.

Factors to consider in determining who will be assigned available campus research space are outlined in Section IV, below.

2) Compensation Protocol

a) Disaster Leave

For several weeks following a major seismic event, many people with Team B responsibilities will be unable to report to work due to transportation problems, child or elder care issues, or the

need to deal with damage to their homes. To improve morale and fairness, personnel available to work on business resumption could receive an award in the form of vacation leave or sabbatical credits.

Exempt and non-exempt employees in positions that accrue vacation leave and who work on business recovery during the first 30 days after the disaster may receive 10 days of vacation that must be used within one year of the emergency declaration.

Faculty and academic administrators, who do not accrue vacation leave, may be granted 10 days of sabbatical credit.

b) Continued Employment

Under normal circumstances, a significant change in the business environment on the campus would result in laying-off or furloughing some research personnel; however, in the extraordinary situation anticipated after a major earthquake, special provisions will be made, as follows:

i. For the first 30 days, there will be no loss of pay or seniority.

ii. Create alternative work assignments for displaced employees whose normal positions will not be available at the end of the 30-day period. For employees who decline alternative work assignments, proceed with granting leaves, layoffs or furloughs in accordance with University policy.

iii. Ladder-rank faculty will have priority over adjunct faculty. Retention priority for assistant professors will be at the discretion of the dean and department chair. For junior professors not called back, consideration will be given, on a case-by-case basis, to granting them extra time on the tenure clock. In all cases, continuity of seniority and benefits for all will be ensured.

iv. Special arrangements will be required for all employees compensated from grants and contracts. The campus will need permission from funding agencies to pay those employees with grant funds, or campus leaders may decide to use state appropriations for this purpose. Summer compensation from grants may not be allowable to researchers if their grants are suspended.

v. On a case-by-case basis, teaching relief may be given to faculty whose research programs were damaged or suspended, to allow them more time for research resumption.

3) Stress and Family Life Issues

Faculty, staff and students will be dealing with many personal issues, and the campus should assist them as much as possible. Per the ***Business Resumption Plan***, Human Resources and the University Health Services plan to create a central resource center with information available to help people identify university and community resources available to assist them.

University Health Services publishes a booklet titled "A Guide for Balancing Work and Family, Information for University of California, Berkeley Faculty and Staff." The booklet lists numerous public and private agencies involved in child care, elder care, and other health services, and should be used as the model for the type of information UHS should make available after a disaster. Areas of concern that will be important to UCB personnel are listed below, with the units and departments that have responsibility for them:

Emergency Loans	Loans & Receivables
Medical Care	University Health Services
Counseling & Mental Health	University Health Services
Caregiving	University Health Services
Housing and Food	Residential and Student Services Programs

4) Developing and Maintaining Research Recovery Capacity

Business resumption planning and research recovery after a disaster are shared responsibilities. VC-R will use the Sponsored Projects Office, Council of Deans, ABOG, Deans and Directors memos and unit meetings to communicate with researchers and administrators about business resumption planning. The annual campus-wide earthquake response exercise provides opportunity to test campus readiness. In spring of 2003, a tabletop business resumption exercise for the Chancellor and Cabinet provided a forum for discussion of major post-disaster operations, including research recovery and space allocation. A similar tabletop exercise was conducted in spring 2004 for the Council of Deans. At least once a year, there should be some event to raise consciousness and convey information to decision makers and, through them, to researchers.

This action plan recommends the immediate appointment of a Research Recovery Advisory Group to be co-chaired by the EVC & P and the VC-Research. Members should include, at a minimum, the VP-Academic Planning & Facilities, the VP-Faculty Welfare, the Chair of the Academic Senate Committee on Research, the Director of Facilities Services-Space Management, and a faculty representative of the Committee on Space Allocation and Capital Improvements (SACI). The group should meet on a regular basis (once or twice a year) to review the planning progress in departments and ORUs, to consider additions or revisions to checklists and/or templates, and to augment or change procedures for retaining research personnel. This group would also advise the Chancellor on space assignment decisions following a disaster. The Academic Senate Committee on Research will be consulted with reference to all changes in plan or practice, as will the Director of the Academic Personnel Office.

Colleges, departments and ORUs should begin to develop their business resumption plans (see Appendix E), within the framework of the campus's resumption plan.

Section IV. Post-Disaster Roles and Responsibilities

This section identifies roles and responsibilities for research maintenance and recovery after an earthquake. Key decisions that will be required are presented first, followed by primary responsibilities and designated actors. It is essential to determine now how post-disaster decisions will be made if we are to minimize the disruption of research operations after an earthquake.

A. Key Administrative Decisions

1) Damage assessment of research facilities: decisions about what is open and what is closed—Facilities Services; Environment, Health & Safety; UC Police Department.

2) Security: restricting access into damaged buildings—UC Police Department.

3) Space management: Facilities Services-Space Management (FS-SM) will keep track of the status and progress of repairs of every building and provide updates to all key individuals and organizations.

4) Space allocation and repair priorities: VC-Research Recovery Advisory Group, advising the Chancellor, with input from FS, EH&S, and SM.

5) Recommendations for research projects to be continued, moved, or interrupted: Deans, Organized Research Unit Directors, Department Chairs will submit recommendations and requests to the VC-Research. Approval will be contingent on available space, infrastructure, systems and other campus priorities.

6) Restoration of electronic and voice communications, and computing capacity: IS&T, FS, units with dedicated servers, and departmental computer support personnel.

7) Communication between and among research departments and the campus executive decision-makers: VC-Research

8) Animal welfare: the Committee for Animal Research Space Allocation (CARSA), the ACUC, and EH&S will advise the Director of OLAC on space issues. VC-R and OLAC will work with Space Management and SACI on animal space.

9) Public relations: Public Affairs will have responsibility and authority for campus-wide information dissemination and public announcements.

B. College, Department and ORU Responsibilities

See the guide to departmental business resumption planning, Appendix E of this report.

1) Deans

- Primary contact with department chairs for decisions about space and resource allocation for research projects
- Primary contact with VC-Research for information about space and resource allocation for research projects

2) Department Chairs, ORU Directors and Museum Directors

- Liaison with faculty members for information about the status of research projects, whether research can continue, and requirements for space, infrastructure and resources
- Primary contact for dean for information about the status of research projects, whether they can remain on campus, relocate or must be discontinued
- Liaison with individual faculty members on what the capacity is to continue their projects and, if so, where
- Primary contact for dean on deciding which projects can stay and which must go elsewhere
- Work with compliance offices to determine how protocols can be modified, if necessary

3) Principal Investigators

- Contact program officers and funding organizations about availability of funds and determine which research resumption expenses are allowable.
- Inform SPO about status of grants.
- Determine the availability of research staff and graduate students
- Assess the condition of their research space and the materials, equipment and records required for their research (per steps outlined in Appendix C)
- Arrange to move research elsewhere on or off campus, as previously planned (see appendix A)

4) Infrastructure Managers

a) Facility Management

- Communicate information about building accessibility, campus decisions about space allocations, safety information
- Serve as building safety officer if required

b) Departmental Computer Support

- Assess condition of campus and local network connections in department space
- Restore networks and systems
- Begin data recovery

5) MSOs

- Determine equipment and supply needs of researchers

- Determine availability of critical resources and work with campus Purchasing and suppliers to expedite delivery
- Work with researchers to identify alternate sources or materials as required
- Manage resource allocation, short- and long-term according to established priorities

C. Building Safety and Security

1) Administration

The campus policy is that no building will be occupied after a disaster until it is inspected and approved for occupancy by Facilities Services, in consultation with Environment, Health & Safety. Damage inspectors in Facilities Services will conduct an initial survey as rapidly as possible and post every campus building with a red tag if it is obviously unsafe for entry, or with a yellow tag if it appears to be structurally sound but in need of further inspections. [Per procedures published in spring, 2004 by the Facilities Reoccupation Group (see Appendix G).]

EH&S staff and/or consultants working under the direction of EH&S will then survey all yellow tagged buildings for spilled hazardous materials. Additional suspected health/safety risks will be evaluated with input from UHS medical professionals. Other personnel will not be given access without appropriate protective equipment until a structure is cleared of all potential hazards. At that time FS damage inspectors will survey the interior of the structures for damages, and other technicians will assess the ventilation and utility systems to determine whether they are in working order. Inspection of all campus buildings will take days and assessment may be interrupted by aftershocks.

When a building is determined by all inspectors to be safe for general occupation, and the Fire Marshal approves the usage plan for the building, it will be posted with a green inspection tag. When any of the responsible specialists determines that a building is not safe for occupation, it will be posted with a red tag (and other warning signs) and secured until it is safe. The UC Police Department and related security organizations will secure the dangerous buildings. If entrance to the building is critical in order to care for research animals or to feed cell lines, safety arrangements will be made with OLAC and other oversight units, the Facilities Manager, the researchers involved, and UCPD.

A priority list of research buildings should be developed and conveyed to Facilities Services in order to ensure that they receive prompt attention and provisions for special needs. Buildings that house animals may need to be evacuated, and buildings with large numbers of freezers containing cell lines or other research materials may need to be accessible to specialists who can keep the freezers running with emergency power or move the freezers to another building where power is available.

2) Deans, Directors and Department Chairs

The time necessary to repair and restore damaged buildings will depend on the extent and types of damage. Deans, directors and department chairs should be informed of campus policy for building reoccupation, and should in turn inform their faculty and researchers of campus policy and procedures. Building occupants will want to enter buildings to retrieve personal and

professional items, and special arrangements to do so will be made on a building-by-building basis, but occupancy will not be allowed under any circumstances if the building is not safe.

3) Principal Investigators
Individual researchers are expected to comply with campus policies and procedures governing access to campus facilities.

D. Research Space Allocation

1) Administration
All space allocations are the responsibility of the Chancellor, with the advice of the Committee on Space Allocation and Capital Improvements. After a damaging earthquake or other major disaster, equitable distribution of limited resources will be of paramount importance. Decisions about the optimal uses of available space will of necessity be made centrally. A small, high-level advisory group will have the overall responsibility for recommending research space allocations, and for planning and supervising the restoration of damaged research space. Circumstances will require that rapid decisions be made; the usual campus decision making process will need to be modified or abbreviated.

The Research Recovery Advisory Group, co-chaired by the EVC & P and the VC-Research, will advise the Chancellor on space assignment decisions.

2) Deans, Directors and Department Chairs
Deans, ORU directors, and department chairs will forward recommendations to the Research Recovery Advisory Group following an earthquake. It is unlikely that many researchers in the biological and physical sciences and engineering can use space not already configured for "wet" labs, but humanities and social science researchers do not require such specialized space. They need computers and space for graduate students to sit, which makes them likely competitors for almost any space--including that normally used for teaching or offices.

Planning for recovery of research will necessitate the development of criteria to be applied when making space allocation decisions. The Research Recovery Advisory Group will work with deans, ORU directors, and department chairs to determine appropriate criteria (see suggested factors below at #4).

3) Principal Investigators
If they determine that their research programs can resume shortly after space is available, PIs will define the minimum space and systems they will require to resume research and identify researchers on campus or at other institutions with whom they could share facilities. They will submit this information to the department chair or ORU director.

4) Suggested Space Allocation Decision Factors

Listed below are several factors that should be considered when establishing the campus-wide criteria for research space assignment in the aftermath of a disaster.

a) Facilities

- Available alternative space for PIs
- Current space allocation of PI
- Uniqueness of space and research requirements
- Possibility for combining operations--compatibility of activities and potential to share core equipment
- Facilities required: libraries, special collections and data
- Efficient use of funds and space-- funds and space that can accommodate more than one research program will have priority.

b) Personnel

- Leaves of absence for some PIs
- Possibility for second shifts
- Career stage of faculty – untenured, tenured, emeritus
- Impact of closure on students--especially graduate students writing theses

c) Funding

- Location in funding cycle--near end, near beginning, in midstream
- Comparative impacts--sensitivity to interruption, duration of interruption
- Size of research program--number of grants and number of students supported

Section V. Resources

A. Pre-Disaster

Campus financial resources are extremely limited at the present time. However, every effort should be made to continue research resumption planning. Special attention should be given to training for essential personnel, support and encouragement of nonstructural hazard mitigation and data back-up, and communication of planning tools for use by deans, department heads, principal investigators and managers.

B. Post-Disaster

It is unrealistic to count on either insurance payments or disaster assistance monies to replace destroyed equipment, research materials, or artifacts. UCB is self-insured, and has supplemental policies as well, but earthquake damages are not covered under any policy. There is no earthquake coverage because premiums for earthquake coverage in California are very high and coverage is not always available. Fire damage is covered under UCB policies, but the funds set aside for paying routine claims may not be sufficient to cover replacement costs of numerous expensive pieces of equipment or objects. The University expects campus departments to pay for special insurance for valuable items to cover fire and other losses.

Disaster assistance funds, provided by the Federal Emergency Management Agency under the Stafford Act, are primarily for the repair of public buildings and utilities. The replacement of building contents has historically been held to be the responsibility of owners. Furthermore, the availability of any funds is contingent upon the completion of structural analyses and the forging of mutual agreements about the extent and types of repair to be undertaken. This takes time--sometimes years.

Researchers may use their grant funds to replace some lost equipment, but most grants are not large enough to cover extensive losses. Federal agencies that fund research such as NIH and NSF have special categories of monies for emergency equipment and facility replacement, but they must be negotiated on a case-by-case basis. This also takes time.

It would be unwise to rely on government or insurance money for the replacement of much lost equipment and materials. Such reimbursement will not happen quickly, if it happens at all. Loss prevention is the only strategy over which we have control.

Appendices

A. Preparedness Checklist for Researchers

B. Data Back-Up with UCBackup

C. Lab Contents Value and Vulnerability Survey

D. OLAC Emergency Response Plan

E. Departmental Business Resumption Planning

F. Setting Up Post-Earthquake Notification Procedures

G. Facilities Reoccupation Policies and Procedures

Appendix A PREPAREDNESS CHECKLIST FOR RESEARCHERS

A quake on the Hayward fault could damage many buildings on campus, in some cases forcing closure for weeks or months, and will certainly interrupt utility services. This checklist is provided to help researchers consider precautionary steps to protect students, post-docs and staff, secure research materials, and safeguard facilities and equipment.

- ❒ **Copies of irreplaceable notes, notebooks, class notes, manuscripts, and other documents are kept in a safe location off campus.**

- ❒ **Computer files are backed up by UCBackup, or elsewhere off campus (*http://socrates.berkeley.edu/%7Eucbackup*).**

- ❒ **Irreplaceable living specimens (animals, plants, stocks, cell lines, DNA constructs etc.) are copied and distributed to sites outside the Bay Area.**

- ❒ **You have contacted OLAC regarding the feasibility of transporting and housing animals in a facility away from the Bay Area.**

- ❒ **Researchers and staff are trained in emergency response and familiar with the provisions of your Building Emergency Plan (*contact your Building Coordinator or Department Safety Coordinator for information on the BEP*).**

- ❒ **Laboratory researchers and staff are aware of which lab appliances are supported by back-up generators, and know how to maintain the research materials in appliances without back-up power if necessary.**

- ❒ **Duplicate copies of drawings, diagrams, plans, or specifications of unique equipment or experimental apparatus are maintained in the event that the scientific equipment needs to be reconstructed.**

- ❒ **Bookshelves, files, appliances, equipment etc. are bolted, braced, or tied down so they will be neither life safety hazards nor damaged and lost.**

- ❒ **You have considered relocating graduate students, postdocs and research staff with colleagues outside the Bay Area to continue research projects.**

- ❒ **You have handy a list of program officers and their telephone numbers.**

Appendix B

Data Back-Up with UCBackup or Offsite Storage Service

What is UCBackup?

The UCBackup service provides centralized *workstation* backup support for the UC Berkeley campus over the campus network. This service is available for Apple Macintosh, Windows and many Unix workstations, but we back up only workstations connected to the campus network.

For a small monthly fee, your computer workstation can be protected from data loss. In the event of hard drive failures, upgrades, and accidental deletions, backed-up files can be recovered through the use of the TSM Software.

The UCBackup service is provided by Central Computing Services and is vendor-supported. We also have a large technical staff to provide support and assistance for the service.

How much does the UCBackup cost?

There is no installation charge since the user (or departmental support person) installs the client software on the workstation.

As of July 1, 2000, the cost of UC Backup Service is determined by the amount of data stored (occupancy). Charges for each machine are calculated as follows:

$10/month for the first gigabyte
$1 for each additional 100 megabytes

If there are 5 or more workstations using the UC Backup Service and there is a technical contact person to support these workstations, the charges for each machine are:

$7/month for the first gigabyte
$1 for each additional 100 megabytes

How does UCBackup work?

The UCBackup service is performed through the use of the TIVOLI Storage Manager-TSM software provided by Tivoli. When the TSM software is installed by the user and the scheduler program is kept running, TSM will automatically detect any changes you make to your hard drive and back up the data to our UCBackup Server periodically. All back ups are performed through the use of the campus network. The backed-up data can then be accessed quickly and easily by the TSM software and restored on to the local workstation from the UCBackup Server through the campus network.

Is UCBackup Secure and Confidential?

Yes. Data is sent directly from the user's workstations to a tape robot in a physically secure location. For Windows, Unix and Netware users, it is possible to have the data encrypted with 56-bit DES before it is sent to the UCBackup server and tape robot. If encryption is not chosen, the data is compressed, which provides a lower level of security than encryption, but is better than passing data in the clear. Once the data is on the UCB server, it is moved to a locked box and then transported to a highly secured commercial facility for offsite storage in locked trunks. Requests for restoration are handled automatically by the tape robot and only the owner of the files may request restorations through the use of an encrypted password.

Does UCBackup Provide Archiving?

Archiving is the ability to save data as of a particular date for a specified, generally long, period of time. The UCBackup system saves the latest five versions of any backed up file, but does not provide archiving.

How do I start using UCBackup?

1) Submit a UCBackup application, which can be downloaded from our web site (socrates/ucbackup), to User & Account Services. We will then issue a nodename, password and back up schedule.

2) Download the TSM Client Software for your OS using the link on our website (socrates/ucbackup) to the Tivoli website.

3) After receiving the nodename, password, and back up schedule from us, install and configure the client TSM Software.

What is Offsite Storage Service?

OSS provides storage of individual data at an offsite location contracted for by IS&T. Researchers save data on a disk or CD, transport it to IS&T, and once a week it is picked up and moved to a location near Sacramento. The costs are minuscule.

Whom do I call for further information?

Contact Central Computing Services at 642-8090 for additional information.

Appendix C: Lab Contents Value and Vulnerability Survey

PI: _____ **Rooms**: _____

☞ What equipment, materials, or data are most important to your research? If any of them were damaged or destroyed in an earthquake, how would that affect your work?

✓ Consider the criteria below in rating the importance of equipment, data, or materials (archived materials included) to your research:

- Equipment replacement cost
- Equipment replacement time (weeks, months)
- Genetically altered animals: replacement cost and time
- Data or materials replacement cost
- Data or materials replacement time (weeks, months, years, never)
- Interruption sensitivity (can tolerate none, or very little)
- Loss of research benefits (income, salutary applications)
- Related hazards that may occasion long clean-up periods (chemicals, biohazard)

Important Equipment (specify room in which it is located)**:**

_____

_____

_____

Important Data:

_____

_____

_____

Important Materials/Animals:

_____

_____

_____

Appendix D. OLAC Recovery Plan (Section III)

The Office of Laboratory Animal Care (OLAC) is responsible for the husbandry and care of all animals used in research and teaching on the campus. Campus animal facilities provide a combined total of 72,500 square feet of indoor animal housing space. All live vertebrate animals are housed in six campus sites managed by OLAC. In addition there is a 23-acre Field Station for Behavioral Research (FSBR) located 4.8 km from the campus on Grizzly Peak. The current average daily census is 40,000 animals.

The department maintains a comprehensive Emergency Disaster Plan. The maintenance of the program is the purview of the Office of Emergency Preparedness. Campus-wide practice exercises take place annually. In the event of a disaster, OLAC has a direct reporting line to the Environment Health and Safety (EH&S) Departmental Operations Center (DOC) which in turn directly communicates any requests for assistance, supplies, or equipment to the central campus Emergency Operations Center (EOC). OLAC has been identified as an *essential care provider* for the Berkeley campus and will, therefore, receive the highest priority in the event of a disaster. Each facility maintains an evacuation/disaster Standard Operating Procedure (SOP) specific to the facility. They also maintain a 4-5 day supply of food and water for all animals on site.

Immediately following a disaster, each OLAC animal facility manager, or designee, will make an **Initial Assessment** of their staff, animals, and their facility and report this information back to the main administrative office or directly to the veterinary staff. Following the **Initial Assessment** there will be a meeting of the OLAC management team to determine and implement a prioritized **Action Plan**. Resources will be allocated appropriately, depending upon the demands and needs of each animal facility. Resumption of animal research activities will depend ultimately upon the severity of the disaster and the timing of campus business and utilities resumption.

Office of Laboratory Animal Care Seismic Recovery Plan

I. Initial Assessment

A. Campus Access
   1. Access of OLAC personnel to the campus.
   2. Number of animal care staff available for duty.
   3. Mobility of personnel around the campus and between facilities.

B. Structural Condition
   1. Are all OLAC animal facilities cleared for access? (If yes go to letter C below).
   2. OLAC Director, or his/her designee, must be allowed access to facilities for public relations/media statements.
   3. If the facilities are not structurally sound and cannot be cleared for OLAC staff access, arrangements to move animals will be initiated. Animals can be moved to the closest structurally sound animal facilities/storage units that are available. A list of facilities and

contact persons is attached to the OLAC Disaster Plan. Animals will be moved according to accessibility, health risks to the animals, safety risks to the humans, and space availability. If investigators can be contacted they will be given the choice of having their animals moved to off-site facilities or euthanized. The Director of OLAC reserves the right to make the ultimate decision regarding animal disposition.

C. Facility Assessments

Animal care staff will be deployed as teams to facilities from a central location, e.g., the Northwest Animal Facility (NAF). Each team will carry one of OLAC's hand-held two-way radios. Team members will wear protective equipment that will include, at a minimum, eye protection and N95 respirators. Teams will document the parameters listed below.

The condition of the facilities:

Structural damage
Electricity, lighting
Heating, Ventilation, Air Conditioning (HVAC)
Water, availability and leaks
Steam leaks
Unusual odors, gas leaks
Unusual sounds

The condition of the animal enclosures:

Cages are upright and closed
Rooms are secure, doors are closed
Estimate number of animals out of cages but in closed animal rooms (note species)
Estimate number of animals out of cages and in hallways (note species)

The status of the animals:

Number of animals alive
Estimate number of dead animals (note room location)
Estimate number of injured animals (note room location)

II. Action Plan

Staff will reconvene at the determined meeting site and time to review material gathered during the Initial Assessment. As necessary the Action Plan may include some of the following items/considerations.

A. Secure Enclosures

In general, any animal displaced during a disaster will be returned to its cage and secured. If animals cannot be returned to their enclosures a veterinary staff member should be notified immediately. Animals from the Biosafety Level 3 facility (BL3) should NOT be handled if they are loose from their cages. No attempt should be made to catch or capture these animals. If animals in the BL3 are loose, everyone should be instructed to leave, the area

should be secured, labeled, 'Do Not Enter', and the veterinary staff should be contacted as soon as possible.

If primates or hyenas are out of their enclosures the area should NOT be entered. No attempt should be made to restrain them. The NAF and FSBR SOPs, respectively, for these situations should be followed. Everyone should be instructed to leave the area immediately, the area should be secured, and the veterinary staff notified. If a veterinary staff member is not available the UC Berkeley police should be called.

B. Stabilize Animals

Locations of injured animals should be documented. If possible the most obvious problem should be recorded. This information should be communicated to the veterinary staff as soon as possible. Animals that cannot be treated will be euthanized for humane reasons.

C. Check Animal Food and Water Supply

If necessary, food and water supplies will be used sparingly from the facility emergency stock. Supplies should be sufficient for 4-5 days. Uneaten food will not be discarded in case it is needed later.

D. Remove Animal Carcasses

Containers with lids should be used or double thick bags/double-bagged and securely sealed.
Facility Rubbermaid food containers can be emptied and used for this purpose.
Freezer function and space availability must be assessed.
Incinerator function and availability must be assessed.
Concerns regarding the threat of human hazard must be assessed.

E. Remove Excess Waste and Soiled Bedding from Animal Cages/Enclosures

This is not a priority unless the conditions become dangerous for the animals or pose a human health hazard. Waste should be securely contained as in letter D above.

III. Tertiary Concerns

Cage/Enclosure washing/sanitation capabilities
- Are the facility cagewashers functional?
- Is sewer drainage intact?
- Is potable water, hot and/or cold, available?

Funding Availability
- Off-site animal housing and care
- Off-site animal research space for investigators and their staff
- Off-site animal transportation and availability of vehicles
- Carcass storage and/or disposal

Appendix E

DEPARTMENTAL BUSINESS RESUMPTION PLANNING

The ***Business Resumption Plan*** provides for functions within the central administration, but it recognizes that the mission-critical functions of UCB--teaching and research--are decentralized. The overall efficacy of the plan relies on a business recovery capacity in each research unit and department.

Below are general guidelines for departmental chairs and ORU directors, derived from the process followed in creating the ***Business Resumption Plan***. For planning and training assistance, contact the campus Business Resumption Coordinator.

- ❑ Create a small business resumption planning group, chaired by someone familiar with the overall operations of the department, that includes the business or personnel manager.
- ❑ Direct the group to meet and consider how the department will function under the following conditions which are very likely following an earthquake:

  - ✔ Program space is damaged or inaccessible
  - ✔ Critical equipment is damaged or inaccessible
  - ✔ There is no power
  - ✔ There is no phone service or fax
  - ✔ There is no central campus computing capacity, no Internet or e-mail
  - ✔ There is no snail mail
  - ✔ Critical data are lost or inaccessible
  - ✔ Staff are affected by the disaster and unable to come to work
  - ✔Important vendors or other business partners are unable to provide goods or services

- ❑ The departmental planning group should consider the business recovery process that will be followed by central administration, Information Systems, and Human Resources, as set forth in this plan, as well as the academic personnel plan to be developed by 6/2002.
- ❑ The departmental planning group should designate for everyone in the department the business resumption team each serves on: A (response), B (recovery), C (no specific assignment). See Section III. G. for more detail.
- ❑ The departmental planning group will consider solutions to the problems anticipated and propose alternative procedures to follow during the recovery period. These should be formalized through appropriate steps into business recovery policies and practices.
- ❑ The departmental chair and the planning group should agree on criteria to be used for making decisions about allocation of available space after an earthquake.
- ❑ Efforts should be made to ensure that everyone in the department is familiar with the Building Emergency Plan, the business recovery plan, and to coordinate the department's plans with those of the college to which it belongs.
- ❑ Each year the business resumption plan should be reviewed and updated as necessary.
- ❑ Contact the campus Business Resumption Coordinator for clarification or assistance.

Appendix F - Setting Up Post-Earthquake Notification Procedures

Before the Disaster

✔ Each department and unit should have an up-to-date phone list. Assign ongoing responsibility for maintaining the list to someone.

✔ Each employee in each department or unit should have been informed by the department manager or personnel manager that he or she is Team A, Team B, or Team C. Each should be familiar with the associated expectations for reporting to work following a disaster.

✔ Everyone on campus should be aware of the radio stations which will carry information about the campus situation (KALX 90.7 FM). An AM station will also be designated to broadcast information.

✔ An emergency information line (1-800-705-9998) will allow recorded messages about the emergency to be accessed by any standard cell or pay phone, free of toll charges. The recorded information will be updated as the situation evolves.

✔ UCB has established a back-up hotsite (*Emergency.Berkeley.Edu*) for emergency information dissemination. On this site there will also be instructions for all employees.

Following the Disaster

✔ If phones are working, supervisors should phone employees on their phone lists and tell them what the plans are for their work.

✔ Employees should tune their portable radios to KALX or the AM station, or phone the 800 number.

✔ If phones are not working, employees should visit the back-up hotsite to determine what is being asked of them.

✔ If there are neither phones nor electricity nor connectivity, employees should follow directions they have been given regarding expectations for Team A, Team B, or Team C employees.

Appendix G – Facilities Reoccupation Policies and Procedures

According to the ***UC Berkeley Facilities Reoccupation Policies and Procedures***, drafted in December 2003, the following considerations will guide facilities inspections and reoccupation on the UC Berkeley campus.

- In the immediate aftermath of an earthquake or other major disaster, the Emergency Operations Center will dispatch inspection teams to all buildings on campus.
- The Vice Chancellor-Facilities Services, acting as the Campus Building Official, will evaluate structural soundness and, in consultation with other pertinent units, consider the overall safety of each building, and authorize reoccupancy as appropriate.
- Environment, Health & Safety will determine whether hazardous materials are present and coordinate their clean-up. Other suspected health/safety risks will be evaluated with input from UHS medical professionals, as needed.
- Facilities Services-Physical Plant will assess the condition of the interior and exterior utilities and coordinate their repair.
- The UC Police Department or contractual security personnel will secure all buildings while they are being inspected, repaired and cleaned up.
- After structures are deemed safe for entry and appropriate clean-up and repairs are accomplished, the Fire Marshal (in EH&S) will evaluate fire and other life safety aspects of the facility's intended use.
- The Office of Laboratory Animal Care personnel will accompany inspectors into all animal facilities and will be consulted on their use issues.
- Until each of the above has approved the general occupancy of a building, security personnel will not allow general entry and usage.

- Facilities Services will adapt the statewide ATC-20 building tagging procedures in order to better protect our employees and students and to protect our assets, as follows:
    - All obviously unsafe buildings will be tagged red (UNSAFE—no entry) until they are repaired.
    - All buildings will be tagged yellow (RESTRICTED USE—only authorized inspectors or repair specialists) until they are cleared of spilled hazardous materials or other utilities or structural problems.
    - No building will be posted green (safe for general occupancy) until all appropriate inspectors have cleared it for use.

- The ***UC Berkeley Facilities Reoccupation Policies and Procedures*** contains a definitive listing of minimal conditions that must be satisfied in order to permit use of campus buildings. "Building Usage and Conditions for Occupancy" sets forth the criteria that must be met in order to allow various groups back into buildings: 1) inspectors and specialists to evaluate damages, 2) clean-up and repair professionals to ready buildings for use, and 3) the general campus community to use them safely if not exactly conveniently.

- For additional information, contact Mark Freiberg, Director of EH&S, at 642-9177, or Sarah Nathe, Office of the Vice Provost-Academic Planning & Facilities, at 642-6414.