



University of California, Davis: Creating an Institutional Framework for Business Continuity

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Preface

The EDUCAUSE Center for Applied Research (ECAR) produces research to promote effective decisions regarding the selection, development, deployment, management, socialization, and use of information technologies in higher education. ECAR research includes

- ◆ research bulletins—short summary analyses of key information technology (IT) issues;
- ◆ research studies—in-depth applied research on complex and consequential technologies and practices;
- ◆ case studies—institution-specific reports designed to exemplify important themes, trends, and experiences in the management of IT investments and activities; and
- ◆ roadmaps—designed to help senior executives quickly grasp the core of important technology issues.

From its most recent research, ECAR published a study, *Shelter from the Storm: IT and Business Continuity in Higher Education* (Yanosky, 2007), to provide subscribers with empirical information about where their business continuity vulnerabilities, plans, and practices stand in relation to surveyed institutions, and what factors are associated with success in planning for the delivery of

IT-dependent business services following a spectrum of potential service disruptions. Study results indicate that business continuity planning is commonly carried out in higher education but that it is often incomplete and resource-constrained, and most plans are not tested.

Literature Review

Our review of the business continuity (BC) literature focused particularly on the multiple standards that address these areas, including the ISO/IEC 17799 information security specification, the emergency-preparedness-oriented National Fire Prevention Association 1600 standard, and best practice frameworks such as the Information Technology Infrastructure Library (ITIL) and the Information Systems Audit and Control Association's Control Objectives for Information and Related Technology (COBIT). In addition, we reviewed a wide range of secondary sources from BC certification organizations and from the IT trade press, academic journals, and journalistic publications.

Online Survey

We e-mailed 1,615 EDUCAUSE member institutions, asking them to take our Web-based survey. Senior IT administrators at

340 institutions completed the survey. Most respondents held the position of chief information officer (CIO) or a comparable title indicating that they are their institution's senior IT leader.

Interviews

We supplemented survey data with in-depth interviews with 15 IT and executive leaders from higher education institutions and corporations involved in BC efforts. In addition, ECAR participated in a two-day business continuity summit sponsored by Microsoft and hosted by EDUCAUSE, at which 40 attendees representing 36 institutions and other organizations discussed BC issues in a facilitated-discussion setting.

Such interviews and forums enable us to deepen our understanding of the processes that are used for BC planning and testing as well as their results. They provided insight into the factors that drive BC planning and those that inhibit it. And they provided interesting examples of how institutions approach the many challenges inherent in this complex undertaking.

Case Studies

Researchers conducted this in-depth case study to complement the core study. We assume readers of this case study will also read the primary study, which provides a general context for the individual case study findings.

We undertook this case study to examine how UC Davis's leadership drove a BC planning initiative throughout the entire campus, highlighting its implications for the institution's Information and Educational Technology (IET) group. ECAR owes a debt of gratitude to Mike Allred, associate vice chancellor for finance/controller; Nicole Woolsey Biggart, dean, Graduate School of Management; Linda Bisson, professor, Department of Viticulture and Enology and chair of the UC Davis Academic Senate;

Jill Blackwelder, associate vice chancellor, Safety Services; Lynne Chronister, associate vice chancellor for research; Doug Hartline, director, Technical Planning and Development; Sharon Henn, assistant dean, Graduate School of Management; Virginia Hinshaw, provost and executive vice chancellor; Maurice "Mo" Hollman, associate vice chancellor, Facilities Operations and Maintenance; Leslyn Kraus, associate director, internal audit; Valerie Lucus, emergency manager; Morna Mellor, director, Data Center and Client Services; Stan Nosek, vice chancellor for administration; Bob Ono, IET security coordinator; Dave Shelby, assistant vice provost; Dennis Shimek, senior associate vice chancellor, Human Resources; Peter Siegel, vice provost, Information and Educational Technology, and chief information officer; Larry Vanderhoef, chancellor; and Cathy VandeVoort, associate adjunct professor, California Regional Primate Center, and chair of the UC Davis Academic Federation.

Introduction

Business continuity is a concern for any efficient IT organization because IT is so intertwined with a college or university's activities. A disruptive incident can occur at any time—for example, a system might crash unexpectedly, a backhoe might accidentally cut the network backbone, a malfunctioning water sprinkler might inadvertently destroy a server farm, or a major disaster could cripple an institution—and IT staff members must be ready to restore functionality quickly.

To be prepared for such disruptions, IT leaders at some institutions have attempted to champion BC to other institutional units and executives. The concept has met with uneven success because it vies for attention with other priorities across institutions. But press footage and firsthand accounts of the 9/11 terrorist attack and Hurricane Katrina aftermaths have drawn attention to the need for preparedness among colleges and universities. Chancellor

Larry Vanderhoef, University of California, Davis, mirrors an increasingly common opinion in higher education: “The whole issue of business continuity and disaster recovery is a matter of stepping up to the plate, saying there is risk, and acknowledging that we need to protect all of our constituents,” he says. “There is a chance that we will never need to put our plans into practice. In fact, we hope we never will. But we have come close enough to situations that people are convinced that this activity is worth their efforts.”

IT units’ centrality to business continuity of all types suggests CIOs might have a special role in the planning efforts. IT leaders can promote these efforts, but if BC planning is to succeed across the institution, it must be embraced at the highest administrative levels and find acceptance throughout schools, colleges, and departments. The complexity of preparing for disruptive incidents of any size requires collaborative effort, since BC rests on the interdependence of campus operations and activities. “Business continuity is not an IT issue, but a campus issue,” states Stan Nosek, vice chancellor for administration at UC Davis. “It is a core responsibility to be stewards of our campus strategic plan. We have to protect our mission, environment, and people as well as help others in trouble.”

Institutional planning activities do, however, provide IT organizations with the opportunity to play a key role in the initiative—specifically, to educate the campus about effective IT business continuity practices as well as further enhance their own operational readiness in a crisis situation. Peter Siegel, vice provost, Information and Educational Technology, and CIO, also points out that each unit has a role to play on the basis of its expertise and responsibilities. He explains that the question is not what function is a priority but which functions of each unit contribute to the broad priorities such as human safety and well-being. Hence, the necessity for collaboration.

A case in point is UC Davis, where support

for business continuity emanates strongly from the chancellor and the provost. BC management resides in the Office of Administration (OOA), with the active involvement and backing of the Information and Educational Technology (IET) group. In the last 18 months, UC Davis has reorganized its safety operations, hired an emergency manager, and mobilized its entire campus around a pandemic planning exercise that serves as the foundation for the university’s BC planning efforts. “OOA has provided a solid foundation for business continuity, and that is why our partnership with Stan’s group is so important,” states Siegel. “We have overlapping purviews and strong shared interests in being models to the campus on business continuity and disaster recovery practices.”

This case study discusses the OOA’s business continuity and disaster recovery activities, highlighting their implications for IET. An overview of UC Davis provides the necessary background on the institution, its organization, and its culture. This is followed by a brief description of the OOA, where the current BC planning effort began, and the IET, the central IT organization at UC Davis. These background sections are followed by a description of BC planning phases at UC Davis, including pre-2005 planning exercises to meet specific BC issues, the creation of institutional BC planning resources and organization, and a focused pandemic planning project that internalized BC throughout UC Davis. We also discuss future BC planning steps at UC Davis, raised awareness and other consequences of current efforts, and lessons learned that can apply to other institutions.

Background: University of California, Davis

Located near Sacramento, UC Davis offers more than 100 majors and 60 graduate programs through its College of Agricultural and Environmental Sciences, College of Biological Sciences, College of Engineering,

and College of Letters and Science, as well as its Graduate School of Management, School of Education, School of Law, School of Medicine, and School of Veterinary Medicine. Research activities have grown significantly in the last five years, with awards increasing from just under \$300 million during 2000–2001 to over \$540 million for 2005–2006. During 2004–2005, undergraduate, graduate, and professional student enrollment approached 30,000. Full-time and part-time faculty members number approximately 8,000. The university employs almost 20,000 people.

UC Davis presents in its culture and organization significant strengths to deal with the problems of business continuity. UC Davis is a large and complex institution, operating a 5,300-acre main campus—the largest in the University of California system—and numerous off-campus laboratories and facilities, including the UC Davis Health System based in Sacramento and Davis. UC Davis manages the second largest animal care program in the United States, tending more than 5,000 animals in more than 200 buildings, including the California National Primate Center. A drive around the campus demonstrates dramatically the potential scope and magnitude that any BC exercise might entail.

Culturally, a strong sense of collegiality permeates UC Davis. “Everyone feels that UC Davis is different, a place where we care about a great institution,” states Dennis Shimek, senior associate vice chancellor, Human Resources. “Our mission and the institution’s life are dependent upon the actions of many people.” Many members of the UC Davis community believe their collegiality will transfer well in a crisis situation, echoing the sentiments of Linda Bisson, professor, Department of Viticulture and Enology, and chair of the UC Davis Academic Senate: “We’re going to hang together in the case of a disaster. We all would work to help out any impacted area.”

The university prides itself, too, on its collaborative environment. “We partner well internally and externally—passing ‘Sandbox 101,’” describes Virginia Hinshaw, provost and executive vice chancellor. “The schools, colleges, departments, and the academic senate all work well together. Our agricultural roots as well as our interdisciplinary graduate programs tie a lot of people from different areas together, building collegiality as well as collaboration.” Senior administrators, too, are “expected to be very informed on all topics pertaining to the university,” states Nosek. “It is our individual fault if we are surprised by anything on this campus.” Chancellor Vanderhoef fosters communications among the deans, vice chancellors, and vice provosts, holding weekly formal meetings and informal brown-bag lunches every Tuesday. “We have strong personal and professional relationships,” continues Nosek. “There is an expectation that everyone will ask or talk about an issue on the table.”

At the University of California system level, no single BC policy exists but rather is implied in disaster preparedness policies and documents. An Office of Emergency Management pulls the various campuses together, ensuring cross-fertilization of ideas and practices among the campuses. Awareness is growing, too, of the notion that UC campuses can combine resources and help each other in business continuity and disaster recovery situations. For example, UC Davis, which lies outside the California earthquake zone, could assist UC Berkeley in the wake of such a disaster. Potential partnering could occur between campuses engaged in similar activities and trained in similar administrative systems. In addition, a UC system–sponsored committee visited each UC campus in 2005 and 2006 to identify its top 10 risks from an emergency standpoint (for example, wild-fires, floods, or earthquakes). Unlike other UC campuses, UC Davis’s major risk may not involve a natural disaster occurring directly on

campus but rather lie in the continuation of its animal and crop care as well as serving as a Bay Area refuge after an earthquake.

Office of Administration

Headed by Stan Nosek, vice chancellor for administration, OOA comprises more than 60 departments and 1,400 staff members who support the campus community by providing a wide array of services. OOA's service units include Accounting and Financial Services, Architects and Engineers, Business Services, Facilities Operations and Maintenance, Fire, Human Resources, Police, and Safety Services.

During Nosek's tenure, UC Davis has worked significantly on business continuity and emergency management issues. When he became vice chancellor of administration in 2003, Nosek inherited a rather fragmented emergency services organization. The police chief reported to the vice chancellor, but the fire chief was located in the Facilities and Operations unit. Emergency Management reported to the police chief, and its perceived law enforcement emphasis hampered institutional involvement. An emergency management committee existed, but its members were frustrated by their lack of progress. "We had a disconnect," Nosek explains. "It occurred to me that we were not leveraging our resources effectively. As my thinking evolved, I began to understand the broader issues around business continuity, pandemics, and other potential events and the need for Emergency Management to report to a higher level within the organization."

So Nosek created the Safety Services unit, which encompasses emergency/disaster management, environmental health and safety, and risk management services. Its associate vice chancellor, Jill Blackwelder, along with the police chief and fire chief, report directly to Nosek, creating a holistic and participatory approach to emergency management. "Now I have three people plus me sitting around the table, so the coopera-

tion that we have received from other service units and providers is 100 percent," continues Nosek. "We quickly received cooperation from IET, the academic community, and other units. Current events make people understand that this is a serious activity, not just an exercise."

With the retirement of the former emergency manager, UC Davis hired Valerie Lucas in January 2006, who has used her experience in research emergency management at Lawrence Berkeley National Laboratory to refocus UC Davis's activities. "Lucas has added a new level of professionalism, and she is the coach, explaining what we have to do to prepare, why we have to do it, and what it means to you," states Mike Allred, associate vice chancellor for finance/controller. "She's done this across senior and middle management as well as across different campus groups."

Information and Educational Technology

Peter M. Siegel, vice provost, Information and Educational Technology, heads IET, which encompasses Applications Development, Classroom Technology Services, Communications Resources, Data Center and Client Services, and Mediaworks. Given such complexity, it is not surprising that UC Davis's IT operations are very diverse and decentralized. Enterprise systems are a mix of vendor and independently developed solutions. A central data center hosts the critical campus information services, including financials, student information systems, the accounting system, the payroll/personnel system, e-mail servers, and infrastructure services for file sharing. A high-performance computing cluster and a few college-managed research systems are located in the data center as well, but typically research and department-level work is handled locally, with larger university units employing their own IT staff.

IT's distributed nature presents particular BC challenges. "I don't think a lot of people

have realized that if a building burns down, there goes 30 years of research in the server down the hall," states Blackwelder. "It is not in a data center somewhere. There clearly are very important IT-related systems at UC Davis that are important for continuity (such as financial information), but there is a wealth of data that does not go through that central infrastructure. It is two very different things for a large, distributed university."

Consequentially, a specific focus of IET's business continuity activities is to enhance its current data facilities and to advocate the housing of critical IT applications in a centralized location. "There is a strong sense that we need a significant investment to ensure that data is entered and housed in a centralized warehouse or in another service where researchers are confident that their data is well protected," states Siegel.

IET is promoting its centralized data center services by emphasizing ease of use, availability, and improved business continuity, but Siegel concedes that their efforts face several challenges. "There is already the sense that we have to be part of this type of solution, but the issue is to determine in which areas will IET provide significant value," continues Siegel. Bob Ono, security coordinator, elaborates: "There are different ideas as to what it means to be in the data center. For example, how does business continuity and business resumption intersect with the notion of husbandry and data protection? Some people just want the data center to have lots of power, to keep it cold, to lock it down, and to leave it alone." Determining suitable geographic areas and finding affordable, suitable space for remote data centers are other particular challenges, especially given California's expensive real estate market.

Even if a department does use IET's central data center, misunderstandings may still exist about its local IT business continuity needs. "If you ask a department about its business recovery plan, all too often the answer will

be that it is unneeded because the IET data center has one," states Morna Mellor, director, Data Center and Client Services. "They may not understand conceptually that their plan should include contingencies if the data center is destroyed or inaccessible. There is a whole aspect of disaster planning and business continuity that escapes the normal department: for example, desktop environments, files, and backup data."

Finally, BC activities themselves "raise a number of IT security issues because people may access their information from insecure locations during a crisis situation," states IET Security Coordinator Ono. "The risk changes a bit if users come in from a non-VPN connection or use a home computer that has been compromised," he continues. "No matter how well we protect the data, we introduce new risks as part of the business continuity activities." A corollary to this is the reliability of outside service providers. "Our network would be fine during a disaster, but there is no way to manage the expectations of the outside service providers," states Siegel. "The home office user may not have Internet access because their ISP is focusing on their core corporate customers in Sacramento."

UC Davis Business Continuity Activities

Sporadic departmental and enterprise BC activities occurred at UC Davis before 2005, focused primarily on specific business continuity requirements.

- ◆ Mike Allred, associate vice chancellor for finance/controller, attributes business recovery activities for financial systems to "management letter comments from external auditors regarding a lack of business continuity planning. Several years ago, two entities—the UC Office of the President–Financial Management, and the controllers—agreed to pursue a concerted approach whereby all campuses can provide the same

answer to our external auditors.” The controllers identified four areas that are most critical for BC planning: payroll, accounts payable, payments to students, and revenue collection from federal, state, and private funding agencies. Each UC campus completed a plan for its four areas that included four scenarios describing a series of crises growing in magnitude, ranging from an extended power outage to a collapsed building that destroyed a campus’s entire financial service operation.

- ◆ The UC payroll/personnel system tends to be centralized, supported by a hot site in Colorado, which is tested annually. UC Davis’s financial area maintains a smaller version of its production financial information system in a separate location away from the main campus that can support up to 100 users in case of an emergency.
- ◆ IET hosted a training course a few years ago when security reports revealed BC gaps for units that work with Health Insurance Portability and Accountability Act (HIPAA) data. An external BC trainer worked with each participant to develop a business continuity plan for data and also to create a list of employee contact information, define critical functions in the units, and identify the person responsible for each. “Every participant walked away with a binder that contained his/her area’s plan,” states IET Security Coordinator Ono. “It took two months of training every other week. Participants actually had to present their plan and meet with the consultant one-on-one to discuss their processes.”
- ◆ One of Dean Nicole Woolsey Biggart’s first priorities at the Graduate School of Management was to create a policy mandating a backup person for all staff personnel. “A person would go on a vacation and no one knew what

to do,” explains Woolsey Biggart. “Everyone, including me, has someone to sign things and to access information during an absence. I did not want anybody to hold a business process hostage.” With regard to institutional activities, Woolsey Biggart states, “Its management is out of my purview, but I will respond to requests and react accordingly if there are problems or requirements. We have many demands on us from the UC system, and we work within our guidelines to achieve our mission. I see business continuity and disaster recovery as another set of guidelines that we need to address.”

- ◆ A potential staff strike several years ago forced UC Davis units to plan for business continuity in the event of high absenteeism among clerical staff.
- ◆ When California experienced an electrical crisis in the early 2000s, UC Davis and other UC institutions each created a plan to identify critical equipment and the type of electrical outlets used in each building, and to inventory all electrical generators. “That project was incredibly staff intensive,” recalls Academic Senate Chair Bisson. “The experts had to pore through every building.”

Creating Institutional BC Resources and Organization

The year 2006 represented a milestone for business continuity and disaster recovery activities at UC Davis, as Vice Chancellor Nosek’s organizational efforts began to bring an institutional focus to UC Davis’s BC activities. As noted earlier, Emergency Manager Lucus also came on board in 2006. One of her first actions was to review the 2005 UC system hazard assessment for the UC Davis campus to help determine the institution’s business continuity and disaster recovery priorities. Then Lucus coordinated the creation of:

- ◆ the UC Davis Master Emergency Management Plan, which establishes policies, procedures, and an organizational structure for responding to and recovering from a major disaster at UC Davis; and
- ◆ the Emergency Operations Center (EOC), activated when an event occurs that overwhelms day-to-day campus operations.

Information about each is available at <<http://safetyservices.ucdavis.edu/emergencymgmt/EOC%20Team.cfm>>.

UC Davis currently has three emergency management organizations (Figure 1). First, the Emergency Management Advisory Council (EMAC) represents a cross section of UC Davis, with representatives from:

- ◆ Davis Division Academic Senate
- ◆ Academic Federation
- ◆ Accounting and Financial Services
- ◆ Architects and Engineers
- ◆ Business Services
- ◆ Environmental Health and Safety
- ◆ Facilities Operations and Maintenance
- ◆ Fire Department
- ◆ Police Department
- ◆ Human Resources
- ◆ Information and Educational Technology
- ◆ Office of Campus Counsel
- ◆ Office of Research
- ◆ Office of Attending Veterinarian
- ◆ Office of Resource Management and Planning
- ◆ Risk Management Services
- ◆ Staff Assembly
- ◆ Division of Student Affairs
- ◆ UC Davis Medical Center
- ◆ University Communications

The executive vice chancellor and provost appoint council members. EMAC, which meets monthly, has no operational role in an emergency. Rather, it oversees and supports the entire emergency operations program by setting the institutional priorities; presenting locally generated suggestions, issues, and

questions; pushing information to members' respective organizations; and coordinating any EMAC activities locally. Assistant Vice Provost Shelby is EMAC's IET representative.

Second, the Executive Policy Group activates, manages, and terminates the EOC during a crisis. "This group makes the hard decisions during the emergency—for example, whether to close down the campus—and they find the necessary financial resources during a disaster," explains Lucus.

Third, the EOC team includes campus personnel who staff the EOC and respond to the declared emergency. EOC command and control follow current national and local regulations and consist of five teams: management, operations, logistics, planning, and finance. The teams' composition depends upon the nature of the crisis. IET's Shelby notes that IET is intricately involved in the operations, planning and intelligence, and logistics areas to assist as necessary.

UC Davis's new Emergency Operations Center opened in the spring of 2006. Previously the university maintained an ad hoc EOC in its alumni visitor center. However, a proposed site for a Transportation and Parking Services Department structure provided an opportunity for the university to build an official EOC. The site is situated near UC Davis's police and fire departments, and its building plans evolved gradually to include an EOC. The new EOC is specifically designed to facilitate management of any potential disasters; its main room divides into two sections, each containing a projection system. It contains a break room, an office, and a separate room in which campus leaders can address issues and policies during an emergency.

Finally, Lucus has arranged for UC Davis staff training at a weeklong Federal Emergency Management Agency training course in Maryland. "The FEMA training classes provide actual training exercises," she explains. "As more and more UC Davis people are trained, the overall institutional understanding about

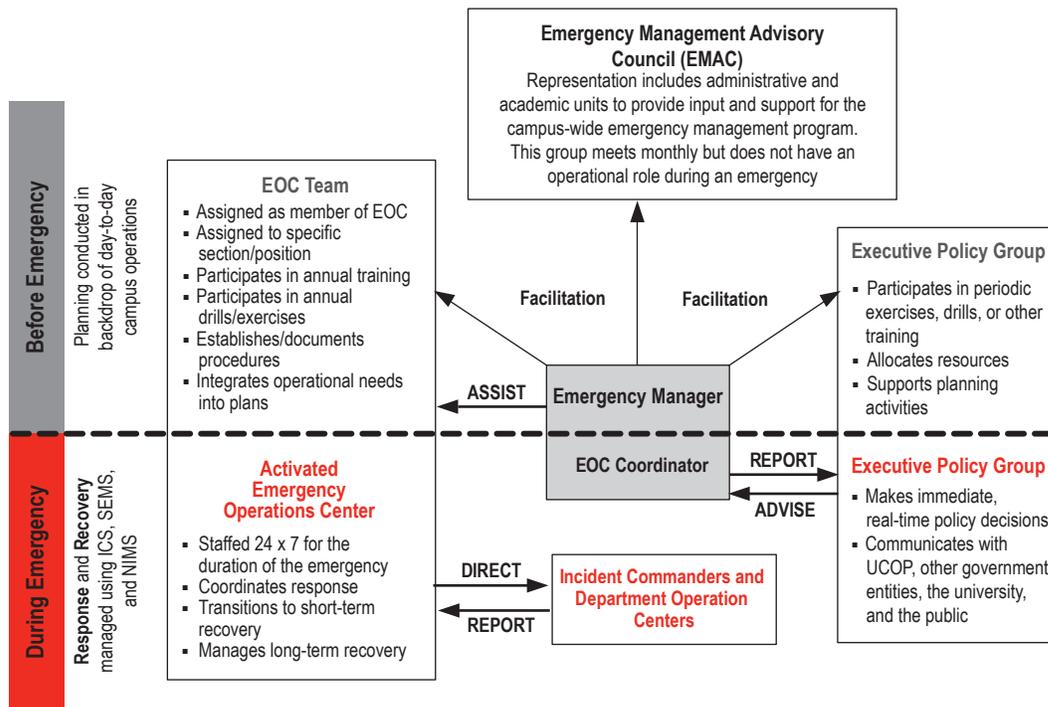


Figure 1. UC Davis Emergency Management Overview

ICS: Incident Command System, NIMS: National Incident Management System, SEMS: Standardized Emergency Management System, UCOP: University of California Office of the President

business continuity and disaster recovery grows. It is a process.” Vice Chancellor for Administration Nosek regards the training as an investment, noting that the many government and industry contacts that UC Davis attendees gain through training course attendance is an added bonus.

Internalizing BC at UC Davis through Pandemic Planning

Reorganizing business continuity responsibilities and building up the emergency management infrastructure created a framework for revitalizing campus BC activities. Just as these initiatives were taking place, however, a new issue emerged that UC Davis’s executives used to extend BC awareness throughout campus departments. During late 2005 and into early 2006, global health authorities grew especially concerned about avian flu and the potential for an influenza pandemic. As a virologist, Provost Hinshaw became increas-

ingly concerned about a pandemic’s impact on UC Davis. “I watched this situation evolve, and as we talked among ourselves we have found out that we have a structure, but no hierarchy for response,” she explains. “So we started investigating this issue, particularly after we hired Valerie [Lucus].”

Consequently, Hinshaw made pandemic planning an institutional mandate to quickly mobilize an organized response to this specific circumstance—a mandate that ultimately could be leveraged for broader campus BC efforts. Because this was a probable event and not an intellectual exercise, it created a clear-cut entrée into UC Davis departments to promote BC planning.

“Pandemic planning has been fortuitous because typically when you talk about business continuity, you start out with an apocalyptic event that leaves everyone so overwhelmed,” explains IET Assistant Vice Provost Shelby. “But pandemic plan-

ning is a perfect place to start. By virtue of its nature, the event would be relatively slow. So departmental planning can start at the first step of determining how to maintain critical functions in the face of a much-reduced workforce. This creates a thought process which then examines for the department: What are the critical functions? Who are the critical staff members? Where are they located? Is there enough trained staff to maintain critical functions with diminished staff? It gives the department a place to get a hold of these issues and gain some traction." The relationship of pandemic planning to BC planning is a key factor in the university's current efforts: Pandemic planning focuses the institutional efforts to eventually produce a BC plan with contingencies for possible events.

Initial discussions among Provost Hinshaw, Safety Services Associate Vice Chancellor Blackwelder, Emergency Manager Lucas, and others determined that the pandemic planning should focus on two specific goals: to preserve human life and well-being and to maintain critical activities. "Those had to be the two drivers, because if you tried to fix everything, you'd just get mired down," explains Hinshaw. "You can't cover every scenario."

Pandemic Planning Tools

Lucas drafted a pandemic planning template that covers a department's BC activities in the event of excessive absenteeism (see <http://safetyservices.ucdavis.edu/emergencymgmt/AvianInfluenza.cfm>). Distributed in spring 2006, the template requires all UC Davis divisions, departments, schools, colleges, or units to fill out their plans by September 2006. Originally the completion date was January 2007, but Hinshaw accelerated the process by pushing the deadline back. The pandemic BCP template asks for the following information:

- ◆ *Planning structure* identifies the area's organizational chain of command,

the pandemic planning work group that filled out this document, and the representative to the UC Davis Communications Council who will disseminate information to this area.

- ◆ *Scenarios and questions* covers several scenarios that track the progression of an influenza pandemic from discovery, transmission, illness, and aftermath and its effect on the area's activities. It explores the impact of 25, 50, or 75 percent absenteeism on an area's operations and the challenges to meeting its logistical requirements. "We identified the major players for each area as well as the first-string group, second string, and third group," states Associate Vice Chancellor Allred. "Now we have to be sure they are trained and have the appropriate security and clearance to access the financial systems. To be honest, we're still working on that, but we have identified the people and they know who they are."
- ◆ *Analysis of business impact* identifies the area's critical functions and processes and the other UC Davis areas that help to maintain them. As the template notes, "In this context, critical functions and processes are defined as those acts (1) necessary to preserve lives (human or animal), (2) maintain the physical plant/infrastructure, or (3) continue essential business services until an emergency has abated. This would include (for example), care and feeding for animal facilities, maintaining the Data Center, keeping all utilities functioning, and maintaining public safety" (UC Davis Emergency Management, 2006, p. 8).
- ◆ *Planning scenarios for UC Davis* prioritizes the area's functions and processes that must operate if the campus is closed.

- ◆ *Emergency contacts* lists the area's appropriate contacts.

Some areas, such as the Office of Research, enhanced the original format so that the template asked specific research-oriented procedural questions—for example, regarding instrumentation and laboratory procedures—that were not necessarily relevant to academic programs. “The template walks them through all the issues, giving them realistic pandemic scenarios from which to discuss strategies,” explains Lucus. “The plan’s focus was how to weather the pandemic and how our campus will look once we get to the other side.” Lucus incorporated assumptions from the World Monetary Fund and the Centers for Disease Control into the scenarios: a pandemic impacting 30 percent of people with no vaccinations and isolations that affected the community in several four- to six-week waves. High absenteeism would be the greatest challenge, and once the pandemic had run its course, economic activity should recover quickly.

“Valerie put in a lot of preplanning to make it easier for the units to complete the plan,” states Sharon Henn, assistant dean, Graduate School of Management. “It took me about 20 hours to complete.” During preparation, Henn attended presentations and a training class, as well as conferring with her fellow assistant deans, the Graduate School of Management dean, and the associate dean to gather their comments. She collaborated with the School of Law because of its similar size and characteristics.

Pandemic Planning Process

When units submit their plans, Lucus sends back two exercises for them to complete:

- ◆ Develop a message, send it to department members through their regular communications channels, ask staff members upon message receipt to call a phone number or log onto a Web site, and determine the response rate in 24 hours.

- ◆ Have all department members sit around a table, put everyone's name in a hat, pull half of the names out, force them to stand by the wall, and discuss how the department will continue to operate without them.

For IET's pandemic plan, “We determined internally how we would continue to operate during an extended period of significant employee absence,” explains IET Assistant Vice Provost Shelby. “We created an assumed list of critical IT functions gleaned from perceptions and conversations with individual departments about their plans for remote access and functionality.” For example, if Student Affairs plans to limit how functional and accessible the student information administrative system is to absent staff members, this impacts IET's preparations to facilitate remote transactions.

In addition, IET posted pandemic-related information on the Safety Services Web site, including detailed charts from each division showing what services could be expected with the campus open and the campus closed, given various levels of staffing. IET also included a lengthy document entitled “Telecommuter Planning Options in the Event of a Pandemic.” Such documents were available to any unit seeking information on how IET might function in the event of a pandemic. Of course, future plan iterations will require IET (and all other units) to examine their assumptions in light of those made by the other units.

Next Steps

UC Davis's activities have implications for the university at large and IET in particular.

Next Steps for the UC Davis Community

The pandemic planning exercise and Nosek's emergency management reorganization have identified several next steps for UC

Davis. For example, now that each individual area has turned in its pandemic plan, the next step is to review and synthesize them to determine where the vulnerabilities lie and whether the individual plans are in concert with each other, and then work together in an iterative fashion to create a consistent framework. "It is a cyclical, iterative, and synchronistic process," explains Emergency Manager Lucus. "You can do one thing and it has to fit into everything else."

On the broader institutional level, one BC priority includes continued training and mass communications. Every monthly EOC meeting includes a scenario for members to discuss, fostering collaboration and understanding of potential resource requirements in the event of an emergency. Several extensive practice exercises are scheduled as well. UC Davis has begun to evaluate mass communication systems, as the institution relies currently on departments to communicate information directly with its people. "We don't have the means to broadcast information via e-mail or phone messages, which creates a lot of vulnerabilities as messages filter down from leadership to faculty members, students, and staff," states Safety Services Associate Vice Chancellor Blackwelder. "This is an important strategic issue."

Another priority is to expand BC planning and to push awareness further down in the departments. "When we started, we did not know how big the iceberg would be," explains UC Davis Academic Senate Chair Bisson. "As you begin, you see things that you never thought about." The broad policies and plans now will lead to "the actual management from a day-to-day perspective," states Cathy VandeVoort, associate adjunct professor, California Regional Primate Center, and chair of the UC Davis Academic Federation. "Now we go to the next level, pushing down to more detail and to where people at the department level are beginning to hear about emergency manage-

ment planning, the need for a plan, and how to respond."

As Bisson continues, "I think in some cases the staff is better informed than the faculty. Our staff did have a meeting to determine the critical people and critical functions and BC issues, but the faculty has received no such request. Faculty members need to be a central part of the planning. It needs to be so clear and common knowledge to all." Some movement is occurring in this area. The dean of the College of Agricultural and Environmental Sciences, Neal K. Van Alfen, wrote in the September 21, 2006, edition of *CA&ES Currents* about the importance of business continuity. Emergency Manager Lucus has posted a video, *Academic Aftershocks*, on the UC Davis emergency/disaster management Web site that vividly shows how CSU coped with the aftermath of the Northridge earthquake (see <http://safetyservices.ucdavis.edu/emergencymgmt>). The video conveys an especially potent message when showing faculty members' reactions as a fire destroys their research.

Implications for IET

From an IT perspective, IET will use the individual pandemic plans to recalibrate IT internal planning efforts or modify users' IT assumptions. "Our major emphasis is to use the pandemic planning as a starting point to codify all the individual plans into a single plan," explains IET Assistant Vice Provost Shelby. "We made no bones about the fact our initial pandemic plan would require additional work. When we constructed it, we based it on a number of hardware, software, and connectivity assumptions. But as we review the individual department plans and their IT service and functionality assumptions, we may need to change their perceptions or we may need to rearrange our own priorities."

Shelby is addressing two closely related processes that are continuing at UC Davis. The pandemic planning process at this

writing remains a work in progress as the initial plans are reviewed and tied together and as interdependence among units across the university becomes apparent. The second process is the overarching BC plan that addresses business interruptions, of which pandemic planning is an example. Some of the planning at UC Davis already reflects an awareness of different types of interruption. It is useful to recall that pandemic planning has been developed as a focus, not as a substitute, for overall continuity planning.

Hopefully, the exercise will promote the need for better IT-related BC practices, bolstering IET's centralized data activities. "Once people come to grips as to how vulnerable all their data sets are in a decentralized configuration, they may look to a centralized data center to mitigate their vulnerabilities," states Safety Services' Blackwelder.

Vice Provost/CIO Siegel wants to reach out to individual users, too. "We hope to turn this exercise back to the departments and ask them to get the message out to their faculty to promote better BC practices in regards to their smaller systems." One means is to ride on security's coattails. "We all recognize that security is not the same thing as business continuity, but I think the work that IET Security Coordinator Bob Ono has done to increase awareness about data management and storage issues at the college and department level is a really good start," states Siegel. This approach may be problematic, as it will substantially increase the amount of work that departments are doing already for IT security.

Vice Chancellor Nosek sees opportunities at the UC system level as well. Lucus is evaluating and potentially utilizing other campuses' best practices. "If it works really well, I have no doubt that the other campuses will decide whether to do something similar without reinventing the wheel," states Nosek. "They won't replicate it exactly, but they will have a good start."

Raised Awareness and Broader Institutional Consequences from Current Efforts

As intended, the pandemic planning process caught people's attention and raised their awareness of many broader BC issues at UC Davis. Nosek began the process of addressing business continuity with the realization that his campus had its own history of earlier, relevant BC plans for various purposes, its own distinctive culture, and at least the beginnings of a workable emergency management organization. He also recognized that nothing had yet focused attention on institutional business continuity.

Nosek also recognizes that current activities represent only the first steps in a much longer process. "It will take several years to have an awareness and appreciation for our activities," he explains. "There are only a handful of people who have an understanding of its importance; business continuity appears on few deans' and vice chancellors' list of the campus's top 10 priorities. It is a long-term communication plan and requires getting a commitment from people all the time. It does not happen by saying this is important; it occurs only when you have more community awareness and an enhanced level of readiness."

One way to address this is to convene formal organizations, like the EMAC, which meets monthly. "If we can keep the [momentum] going," states IET Assistant Vice Provost Shelby, "it will feed very nicely into the bigger picture and make progress to a business continuity plan." Participation in the advisory council is another way to gain that support, because each member takes responsibility for moving policies and issues down to his or her respective organization. A specific project such as pandemic planning provides focus.

Beyond such centralized activities, UC Davis executives also envision a variety of ways to build BC awareness campus-wide from the foundation that the reorganization and pandemic planning efforts created.

Extending Business Unit Awareness

The pandemic planning has raised awareness of the interdependence of units in a broader BC context. “Each area manager is in charge of business continuity,” states Associate Vice Chancellor Allred. “We have to coordinate together because we cannot, for example, produce checks to students unless accounts payable [is] involved. So we have to understand all the relevant processes and how we make all those hand-offs.” And Blackwelder notes, “There are cascading effects and questions that have been helpful and positive in getting people to think about how each area relies on other departments and whether its assumptions during a crisis situation are reasonable.” These discussions are especially relevant for IET, as IT is typically the conduit for these linkages to occur.

Such interdependence requires the further awareness of an infrastructure shared by or tying together various units. No unit is more involved with infrastructure requirements than IET, but the others’ awareness of what IET can and cannot provide has grown with pandemic planning. “The pandemic planning forces each area to think about the other campus services that they assume will be there,” says Blackwelder. “For example, is working from home a good assumption? Will it be possible to access the campus system remotely? Can the campus system support half the people working remotely? Departments need to know their technical limitations, such as the reliability of their local Internet service provider from home. There are really important linkages that people were forced to think about. It really opens their eyes to new issues and situations.”

Implications for Instruction and Research

Such complexity extends beyond business and service units to academic departments and research units, which are now addressing

broader BC issues. For example, the academic senate, which represents the faculty, is tackling the complex task of writing BC guidelines for teaching and research. “Continuity differs in conjunction with the type of teaching,” explains Academic Senate Chair Bisson. “One size is not going to fit all. One goal is to hold classes online if possible, but some classes do have to meet in person.” In the course of examining the potential of online delivery, the senate will interact with IET to discover further constraints. The senate is also wrestling with what constitutes enough class time to grade students for the class. One alternative is to create a special grade designation like “T” for “Taken” that is not calculated into a student’s GPA.

Researchers now have greater awareness about the need for BC policies and guidelines for practices such as backing up research and making copies of notebooks. The academic senate wants to develop the means to determine when and if research projects can be “hibernated” to reduce institutional stress during a crisis. “It will not be business as usual if half of the campus is sick,” continues Bisson. “For example, it may curtail some research activities because the fire department is not available to help. We need a mechanism to identify who is in the ‘critical needs’ window of research. Each PI will have to take responsibility for their own laboratory and make sure their staff is informed of the lab’s business continuity plan and the realistic services that it can expect during a crisis situation.” The whole planning process—for pandemic and beyond—invites extensive collaboration between IET and the individual PIs to ensure continuity.

Maintaining Institutional Momentum

Broader participation presents the problem of maintaining planning momentum. The necessary process of involving more and more people offers such a challenge. “On

the EMAC, we initially accomplished things very quickly because it involved very few people,” states Academic Federation Chair VandeVoort. “Every time you take planning to the next level, the number of people involved increases by an order of magnitude. This will be a real challenge as we get down to the nuts and bolts.” Scaling up is both a challenge and a necessity. Or, as Shelby describes, “Every move we make forward helps identify 10 more questions that we need to answer.”

Scaling up also highlights the fact that no single unit, such as IT, has the leverage to keep campus attention focused on potential events. BC planning is truly “all for one and one for all.” As Shelby explains, “It is something that sweeps up the entire organization because of the communications, the understanding, and the connections between all the units.” He adds, “Unless everyone is ‘playing ball,’ it is not going to work.” Shelby and others believe UC Davis is fortunate that Provost Hinshaw is a strong proponent who can mobilize and motivate the institution accordingly.

Another consequence of broadening the BC effort is escalating cost. Few institutions can ignore this potential hurdle to effective planning and implementation. During BC planning, opportunity costs can be particularly high when limited resources make even day-to-day operations challenging. For example, UC Davis departmental technical staff members who have recently added IT security compliance to their duties want reassurance about the wisdom of devoting time to BC planning. Further, some administrative areas have already absorbed staff reductions, straining resources for BC planning. Associate Vice Chancellor Allred, for example, constantly works on these issues, making such planning a standing agenda item at his weekly staff meetings. Senior management has supported his effort and given him recognition when his area completed milestones in BC and pandemic planning projects.

Cost trade-offs may loom, too. For example, Allred cites a major unplanned expense to replace a chiller that died during the summer. In the event of such a surprise, he looks at “What other projects may be delayed that will impact the services that we provide or the efficiencies that we can increase internally? The fact is the chiller replacement, for example, was important, and I had to replace it. I don’t want to be in a position where our area can’t produce checks because the data center is down and there is no contingency plan.” BC planning, in his view, offers the same sort of decision opportunity: what needs to be delayed in order to complete a high-priority planning project.

The smoothness of the UC Davis effort may unintentionally seem to hide the quite necessary effort of iterative work that must broaden planning, meet challenges, and overcome hurdles. The pandemic planning exercise provoked broader planning, since successful planning rests on identifying problems and reaching solutions. Lynne Chronister, associate vice chancellor for research, notes that “the exercise requires that we ask some questions that we did not before because we did not have any answers.” Allred compares BC planning to succession planning. “It gets you to think differently,” he explains. “You appreciate the fact that if your first group of people is gone, is your second or third tier of people prepared to step in? It reemphasized the fact that so many employees are ready to retire within five years and we need to prepare accordingly by making our processes simpler and to build the rules into our system so people can come in and be productive in a short period of time. If these are in place, you will be successful in many areas—including business continuity.” As Director Mellor notes, “Pandemic planning has facilitated conversations about business continuity in a dramatic way.”

Lessons Learned

Members of the UC Davis community offer several lessons learned: some are general truisms; others are specific to BC and disaster management practices. Not all of the lessons from UC Davis are replicable elsewhere, but the model(s) can be instructive as they are adopted to fit other cultures.

- ◆ *Just start.*

Institutions of any size or complexity can find the wisdom of this lesson. “Business continuity planning takes time, energy, and resources,” states Allred. “Don’t keep analyzing or delaying until you have the budget to do it. Just start somewhere.”

- ◆ *Know your institution.*

The organization, plans, and processes are designed around the UC Davis culture of cooperation, excitement, and confidence. The willingness to support initiatives that may benefit everyone encourages students, staff, faculty, and administrators to support such campus-wide processes as the pandemic planning. The enthusiasm for the first steps bodes well for the iterations to follow. UC Davis’s executive-driven approach has worked effectively; institutions with more decentralized or fractious cultures might have to build BC awareness from selected centers. The key is to match BC activities with the local culture.

- ◆ *Solidify strong senior administrative support.*

Everyone interviewed mentioned UC Davis’s strong senior administrative support in this activity as a significant force. “Our biggest investment thus far has been people’s time—and that is money,” explains Provost Hinshaw. “People here already work hard to address the many challenges already on their plates. I would not have asked them to take on this new planning activity unless I believed it was very important. I asked people to do this because their efforts in this direction will make a big difference for UC Davis.” As proof of her commitment, Hinshaw’s area served as a pilot for the pandemic planning project. “I could

not ask other people to complete this project if I were not willing to do it, too,” continues Hinshaw. “The activity gave me a good sense of what the process entailed.”

The pattern of senior administrative support extends to IET, since Vice Provost/CIO Siegel and Assistant Vice Provost Shelby provide leadership in the institution and, of course, within their unit. However senior administrative organization differs, the necessity for specific, active leadership cannot be underestimated. Mere verbal support probably will not suffice in most institutions.

- ◆ *Structure makes the planning process easier and creates consistency.*

“The administrators have to provide the infrastructure, the support, the reminding, and the direction to make it easy for people to do the right thing,” states Vice Chancellor for Administration Nosek. “Cut business continuity and disaster recovery planning into bite-sized pieces.” A case in point is the pandemic planning template. “The template is a key,” states Sharon Henn, assistant dean, Graduate School of Management. “Having an expert create a framework was beneficial because if I [were] out there on my own, the exercise would be much more time-consuming.” An added bonus is that the template creates consistency and provides a product that makes the iterative process easier. Human Resources Senior Associate Vice Chancellor Shimek also notes that the pandemic planning exercise followed “a classic, cookbook approach. There was nothing unusual, so everyone felt very comfortable about the way the program was put together. The program was introduced in a measured way. The planning and the steps were very public. There were no surprises.”

Emergency Manager Lucus and her committee provided direction; other units, including IET and HR, could follow that lead. Shimek’s emphasis on specificity, format, and clear public steps can be readily (although not easily) followed. Not everyone at UC Davis knew about every step from the beginning,

but those in leadership positions, from provost to department chairs and administrative heads, were given ample information. Other institutions might look carefully at the openness of the UC Davis process. The comfort level Shimek refers to may be obtained differently in another place, but it supports the whole process.

◆ *Designate a qualified point person.*

The appointment of Lucus with her significant credentials signaled to the Davis campus a potential change that quickly evolved into discernible change. Interviewees mentioned Lucus's impact on the project, as her credentials in business continuity and disaster recovery as well as her ownership jump-started the campus's BC and disaster recovery planning effort and mobilized the pandemic planning exercise. "There is an executive-level commitment to the idea," states Shelby. "She has the senior administrator's attention and so has the attention of the rest of us as well." In addition, the members of EMAC provide leadership within their own units.

◆ *Design a specific project to help the institution internalize the importance of BC planning, to provide information, and to create relevant processes.*

The principle "choose something that people can relate to" led to the pandemic planning. UC Davis is not susceptible to earthquakes, extreme weather, or tornadoes, but many people here believe a pandemic is a possibility. Safety Services Associate Vice Chancellor Blackwelder also emphasized the need to communicate continually to the campus that pandemic planning was "a back-drop that is really applicable to anything...that it's not a wasted effort if a pandemic does not occur." Institutions must find a focus that fits their circumstances and environment. Specificity tailors the project to the situation and culture, helping faculty and staff to accept the need for BC planning. The leadership at UC Davis saw the need for such planning but sought the focus of pandemic planning.

◆ *Don't aim for perfection.*

"Another drawback of our previous effort is that it was approached at a very intellectual level as opposed to a very practical level," states Blackwelder. "There was an attitude that you have to complete your plan a certain way or it was not compliant. It is more important to have a good plan, not a perfect plan, using the process to get arm-in-arm with people. Valerie [Lucus], for example, is a realist who knows that everyone has a different way of thinking about this issue. Her pandemic planning template gave people a running start, and some areas, for example the Office of Research, enhanced them according to their needs." The culture and organization at UC Davis as described in this case study might suggest a procedure that would not fit other institutions. A lesson of the template, as Blackwelder explains, is to provide a usable model, not a rigid set of expectations and demands.

◆ *Draw on previous activities.*

The University of California system-wide financial services planning effort, the strike plan, and the electrical crisis management plan provided important information that could be carried into BC and disaster recovery planning. "The range of business continuity and disaster recovery planning includes various drivers and initiating events, some of which differ significantly from those in pandemic planning. In many instances, an event is localized so that resources, expertise, and support can be obtained from neighboring regions," states Shelby. "We found the commonality of strike planning is how to maintain operations if fewer people report to work. The only difference is during a strike absentees are not going to try to connect remotely to work. With pandemic planning, you don't know who will be absent and whether or not they can work from home." Shelby draws a lesson from strike planning that could be replicated in other plans and in other places. Previous activities can be used as internal lessons to inform current planners about successful and unsuccessful examples "at home."

The recent pandemic planning experience, too, provided UC Davis with another activity from which to draw as the institution continues to hone its BC plans. “True business continuity and disaster recovery have yet another set of drivers that more carefully defines where it intersects with the pandemic planning,” continues Shelby. “Business continuity is more traditionally based upon a quasi-localized event. You can augment coverage with someone who is outside the affected zone. Maybe you get to a point where you create a chart about incident drivers and assumptions; each one has their own set of challenges.” IET posted materials on the Safety Services Web site to help units in their pandemic planning, implementing Shelby’s vision of appropriate charts. In this comment, Shelby raises the opportunity (albeit complex) of recognizing the potential of partnerships for dealing with potential disasters, noting particularly what natural interference might impact institution A without causing interruption at institution B. Such planning requires detailed examination of the drivers for BC planning: How differently would various interruptions impact the campus, for example, and how might another partner be impacted?

- ◆ *Manage the timing and sequence of the planning process.*

Business continuity is not a skill learned overnight, but preparedness will not wait for experience. The EMAC is still getting its feet wet, as it began meeting only in June 2006. But planning efforts cannot linger. As noted earlier, the provost pushed back the original pandemic planning deadline by several months to keep this from becoming “another flavor of the month,” to demonstrate her commitment to this project and, most importantly, for the campus to be prepared if a pandemic were to hit in the winter of 2007. The drive to complete the first stages of the UC Davis plan suggests the need for moving forward with flexibility to demonstrate success as well as building momentum for later steps.

- ◆ *Business continuity is both complex and simple.*

“People typically think of business continuity as enormous, expensive, and time-consuming,” explains Director Mellor. “They get overwhelmed and don’t do it. But there are two ends of the spectrum here. There is expensive commitment for redundancy of data centers, and there are very easy and economic things a person can do: making copies of your department paperwork, storing CD copies of research someplace other than your desk, and just keeping a copy of the department business continuity/disaster recovery plan at home.” Institutional leaders may be daunted by the complexity of BC planning, but Mellor’s comment suggests that simple steps at all levels can move a process forward. Variations of size and culture may change the definitions of “simple” and “complex,” but the lesson remains.

Conclusion

Business continuity activities are admittedly still nascent at UC Davis. There is still work to do, and the process is never complete. “We are not sure where it will go, but we’re focused on getting the basics down and taking it from there,” states Nosek. This case study’s take-away, however, is that UC Davis has completed the first steps, using a formal and organized approach. “Pandemic planning mobilized us, giving us a way to start thinking about it in a doable manner that ends up as components of an overarching business continuity/disaster recovery plan,” states IET’s Shelby. Nosek continues, “As more people understand the concept and come up with suggestions, it is an easier story for resource allocation. More people will understand how it impacts them. They are more willing to be more a part of the program.” The approach, by all accounts, has been successful at UC Davis in part because the planning matches one of the

institution's strengths, a notably collaborative spirit within the culture. Speaking of the UC Davis community, Vice Provost/CIO Siegel observes, "We understand that success depends on bringing these various areas of expertise together in an ongoing effort for joint planning, because success depends on integrating their complementary strengths."

References

- UC Davis Emergency Management. (2006). Avian influenza pandemic BCP template. Retrieved February 12, 2007, from <http://safetyservices.ucdavis.edu/emergencymgmt/AvianInfluenza.cfm> (see "Division Template for BCP Planning" link).
- Yanosky, R. (2007). *Shelter from the storm: IT and business continuity in higher education* (Research Study, Vol. 1). Boulder, CO: EDUCAUSE Center for Applied Research. Available from <http://www.educause.edu/ecar/>