Success Story

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—Mark Green,
Professor,
City University of Hong Kong

City University of Hong Kong: Reliable Power for Immersive Creativity

The Challange
Protection for an SGI® Onyx® 3400 system against power problems to ensure a stable and interruption-free virtual reality research environment.

The SGI Solution
The UPSafe™ 9170 package provides reliable, filtered power to all types of electronic equipment. It prevents hardware damage or malfunction due to power disturbances and preserves the integrity of data stored in computer systems

The Result
System downtime due to a power outage was averted, research projects were uninterrupted, and the Onyx 3400 investment was protected by UPSafe 9170

Just past one o'clock on an August morning, a team of graduate students at City University of Hong Kong is on the brink of a minor breakthrough in virtual reality interfaces. They are leaning forward, looking through stereo goggles at the high-speed, three-dimensional night driving experience on the 10-foot-square rear-projection screen in front of them. Time is of no importance; they are immersed in the challenges of their environment and red-eyed from hours of experimentation. They barely hear the roar of tropical rain outside as a drenching summer storm blows ashore from the South China Sea. When the downpour knocks out the power, the lights go out—but not the monitors that display the remarkable virtual environment they've been working on for five hours. The team members don't miss a beat as the emergency lighting comes up. They complete their experiment and lean back with weary smiles. All their hard work—stored on an SGI® Onyx® family visualization supercomputer and on their workstations—is being protected by SGI® UPSafe™ technology.

School of Creative Media: Teaching at the Leading Edge
City University of Hong Kong founded its School of Creative Media in 1998 to fill Hong Kong's growing need for media professionals schooled in leading-edge technology. The school has technical facilities for the study of video production, interactive multimedia, audio production, and other media-based activities.

In October 2001, the school moved aggressively into the studies of immersive environments with the installation of an Onyx family visualization supercomputer in its MFA (master of fine arts) lab, which also includes Silicon Graphics® workstations and a high-speed network. Faculty and graduate students develop projects that explore the unique power of stereo graphics generated by a 4-CPU SGI Onyx 3400 visualization supercomputer.

"For high performance, for multiple graphics pipes and projectors, SGI is the way to go, and it's all in a single box," says Professor Mark Green, who worked extensively with SGI® visualization systems at the University of Alberta in Canada before accepting his Hong Kong post. "The other thing that's attractive to us, because we're a media school, is the fact that the display output is totally programmable on the SGI system, so we have a wide range of display formats to work with."

The output of the Onyx 3400 system, which includes 1GB of memory, 108GB of storage, and an InfiniteReality3™ graphics pipe, is displayed on flat 10x10-foot screens by Christie projectors. Green and his graduate students, wearing Stereographics goggles, create virtual environments to study the way users interact with immersive images and to develop innovative ways to put Onyx visualization technology to work.

"Our students are artists and content creators, not computer science majors," says Green. "We want to give them the ability to develop content in a way that makes them most productive. And while there are good off-the-shelf software packages for animation and modeling, there isn't anything like that for creating virtual environments. So during the first term of our virtual reality course, which began in February 2002, our students used SGI technology to develop a co-authoring tool for virtual reality projects in art and entertainment."

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Scientific Officer,
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Managed Services UPSafe Implementation at a Glance
sgi.com/go/upsafe

The SGI UPSafe power-protection solution is critical for business continuity. It operates between the electrical power source and electronic equipment, protecting data stored on servers and storage devices from corruption caused by power problems.

UPSafe solutions include:
- UPSafe™ 5115 and 5125 (500 VA to 3 kVA)—smart power protection for workstations and networks
- UPSafe™ 9120 (500 VA to 6 kVA)—online power protection for workstations and servers alike
- UPSafe™ 9150 (8 kVA to 15 kVA)—flexible, online power protection for single-phase and three-phase systems
- UPSafe 9170 (3 kVA to 18 kVA)—scalable, redundant power protection for the SGI® Origin® family of servers, high-availability applications, or heterogeneous compute environments
- UPSafe™ 9330 and 9315 (10 kVA to 750 kVA)—three-phase online power-protection solution for data centers, facilities, and high-availability applications

Benefits and Value
- A complete solution that includes hardware, software, shipping, and service warranty
- Protection from data corruption and downtime caused by power outages
- A solution critical to businesses that provide uninterrupted service to end users

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Another school project studies the integration of computing technologies from PDAs to desktop computers to full-blown VR studios. The goal is to permit users and content creators to much more easily migrate content and applications across technologies. In the school's VR studio—a CAVE in progress—two 10x10-foot rear-projection screens with stereo projectors running off a single graphics pipe from the Onyx 3400 system form an L-shaped environment in which the entire room will be tracked. Students will use the room to experiment with a variety of controls and behaviors. For all these projects, students favor realism over fantasy when creating experimental environments—even though game development may be the most likely use of the tools they're creating.

The First Priority: A Stable Power Source
Before the school ever turned on its Onyx 3400 system, it had to solve an infrastructure problem. The school's final home will not be ready until 2006. Meanwhile, the school and its virtual-reality teaching facility reside in the heart of Hong Kong, in a building that is far from ideal from the standpoint of power.

"We're in such a small space," says Antony Chan, scientific officer for the school. "Physically, the whole university is about the size of a U.S. high school. We found it very difficult to find space for the School of Creative Media when it was founded, and we wound up converting a covered carpark for our use. We have many computers, and the power consumption is far greater than what the carpark was designed for. Of course, we're adding a lot of power—but it's not very stable."

School officials decided they would not install their new Onyx 3400 system until stable, reliable, filtered power was available. Their prime concerns were to protect the Onyx family system against damage, protect research data, and ensure that researchers could rely on interruption-free work sessions. The school's researchers rarely work on rigid schedules. The Onyx 3400 system is often in use in the small hours of the morning, when a loss of data or even a break in a researcher's concentration can be disastrous to the successful completion of a project.

"An uninterruptible power system is a basic requirement for any major system implementation," says Chan. "We want our researchers to be able to work without interruption anytime."

The Choice: UPSafe 9170
The school studied its choices in uninterruptible power system (UPS) technology and selected a 12 kVA SGI® UPSafe 9170 uninterruptible power system with N+1 redundancy—a flexible, scalable solution that combines logic and power in the same module. "We looked at the best-known companies in the field, but we chose UPSafe because we respected SGI as a vendor and service support provider," says Chan. "Another factor was the desire to avoid multivendor situations, which can be very chaotic. When problems come up, A blames C and B blames A. We preferred a totally integrated solution."

Installation of the UPSafe 9170 solution was completed by SGI Managed Services in October 2001, and the Onyx system was turned on. "SGI provides the most professional technical support of all the vendors that I've worked with," says Chan. "They solved our problems and reminded us of things we needed to do to make the installation smooth and complete. Their post-installation support of both the Onyx 3400 system and the UPSafe system has been very helpful."

The UPSafe 9170 solution filters the school's unstable power source, protecting the Onyx hardware from potential damage or malfunction and preserving the integrity of the data stored on the system. Protecting the Onyx 3400 system also protects a number of other school systems from downtime. When faculty and students use the Silicon Graphics® Octane® workstations in the MFA lab, their home directories and data, stored on the Onyx 3400 system, are protected against power loss or fluctuations. The storage capacity of the Onyx family system is also shared with other school systems beyond the MFA lab.

The school's investment in UPSafe proved to be a wise one. The school lost power at night on three occasions, and the 9170 solution took over to provide smooth, uninterrupted power. "We were so happy to know the UPSafe system was there," says Chan. "Downtime was eliminated, the possibility of hardware failure was avoided, and our people knew they didn't have to rush back to the office to assess damage and go through reboot procedures. Power problems never interfered with the productivity of our researchers."

The Future: Completing the CAVE
The school's virtual reality system is only at its primary stage and will continue to grow. "We're building it in stages," says Green. "We plan to add more 10x10 walls, more projectors, and more graphics pipes. We'll keep it growing and experiment as we go."

The school's UPSafe 9170 system is large enough to handle this growth—and to protect its investment in SGI visualization technology for the foreseeable future.

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