



Office of Research

Senior Vice President for Research
208 Bricker Hall
190 North Oval Mall
Columbus, OH 43210-1321

Phone (614) 292-1582
Fax (614) 292-6602

October 10, 2006

Robert McGrath
Senior Vice President for Research
208 Bricker Hall
190 North Oval Mall
CAMPUS

RE: Report of Graves Hall Incident

Dear Bob:

Attached please find the final report of the Graves Hall incident that was prepared after an investigation involving the Office of Research, ULAR, the College of Medicine and Facilities, Operations and Development.

The report highlights the findings of the investigation and provides recommendations and corrective actions that have been and/or will be taken to rectify the issues that led to the unfortunate Graves Hall incident. I have also attached a table containing a census of the animal losses cross-referenced by principal investigator.

As mentioned in the body of the report, an equal sharing of the costs for reimbursement of lost animals has been agreed upon by the Office of Research, the Office of Business and Finance and the College of Medicine. Once the final figures are obtained from the College of Medicine, Michael DeWees will coordinate with Business and Finance the transfer of funds (one-third share each) to the College of Medicine for restitution to the affected principal investigators.

Respectfully submitted,

A handwritten signature in cursive script that reads "Doug".

Douglas A. Kniss, PhD
Senior Associate Vice President for Research

cc: Melissa Bellini
Todd Guttman
Earle Holland
Judith Neidig
William Shkurti
Lane Wallace
Caroline Whitacre

October 10, 2006

REPORT ON GRAVES HALL POWER OUTAGE AND RESULTING LOSS OF RESEARCH ANIMALS (MICE, RATS, RABBIT)

SUMMARY OF THE INCIDENT

On July 12, 2006 scheduled maintenance was performed on a primary power grid feeding the The Ohio State University Medical Center. This required taking the primary electrical source offline and switching to the backup source. The Medical Center power grid consists of two separate electrical circuits, a primary source and a backup secondary source, both of which are typically fully operational. Unfortunately, at approximately 6 PM on July 12th, the secondary source failed, leaving at least 10 buildings on the Medical Center campus without power. Although a utilities crew was immediately dispatched to the site of the power outage, the system was operating on a backup circuit and therefore the affected buildings were without power for approximately 8 hours. All patient care areas within the Medical Center complex have emergency power generators and therefore at no time were any patients exposed to temperature extremes.

In parallel, Dr. Mary Cheng, a postdoctoral researcher, who was working in the Graves Hall vivarium, notified the University's Facilities, Operations and Development (FOD) Service Desk, a 24-hour emergency dispatch call-in service, of a potential power problem at approximately 6:30 PM on July 12th. Unfortunately, neither the initial facilities crew's response to the problem nor Dr. Cheng's call stimulated notification of any personnel within University Laboratory Animal Resources (ULAR). Power was eventually restored to all Medical Center buildings at approximately 2:30 AM on July 13th. Unfortunately, the air conditioning service in the Graves Hall vivarium was not reestablished. Consequently, when ULAR staff members arrived for work on the morning of July 13th, they were unaware that there had been a power outage the evening before.

As a result of the power outage, extreme temperature excursions within the Graves Hall vivarium, housing 5,100 animals, resulted in the death of 689 research animals, including 598 mice, 90 rats, and one rabbit. This represents approximately 13% of the total Graves Hall vivarium census. Monitors within the facility recorded temperatures which ranged from 96.3-105.9°F. During the investigation it was discovered by the team that the HVAC system in Graves Hall was in the fail "on" mode, meaning that upon restoration of power the heating unit comes on to prevent the freezing of pipes within the building. This is a feature of many of the older buildings on campus, and was the cause of the excessive heat that was introduced into the vivarium when electricity was restored. This problem has since been corrected and the system is now in the fail "off" mode, meaning heat will not be turned on when power is restored.

October 10, 2006

INVESTIGATION

An investigation was initiated by the Office of Research (Douglas Kniss), ULAR (Valerie Bergdall), and FOD (Melissa Bellini). The information confirmed the above summary and found that the alarm system, which had been installed in the Graves Hall vivarium was not connected to the Service Desk nor to ULAR personnel, and therefore did not alert ULAR of the environmental problem. In addition, the alarm system did not feature a battery backup power supply, and thus even had the alarm been properly installed and connected to the Service Desk, the loss of electrical power would have resulted in its failure to notify ULAR or FOD personnel.

These findings were reported to the Senior Vice President for Research, the Senior Vice President for Business and Finance, the Associate Vice President for Research in the College of Medicine, and the Chair of the Institutional Animal Care and Use Committee (IACUC), which made the recommendations and corrective actions listed below based on many sources of input during the investigation. The Office of Research will work in cooperation with all concerned parties to effect immediate and sustained changes that include enhanced communication among FOD, ULAR, and Building Coordinators of facilities in which ULAR vivaria are housed, improvements to alarm systems and mechanisms to alert appropriate authorities in a real-time and effective manner in the event of an environmental deviation, and create a culture within the University in which all staff members are engaged fully in the research enterprise.

ACTIONS AND RECOMMENDATIONS

It is critical that provisions be undertaken to assure that the unfortunate Graves Hall incident does not occur again in the future. Below are listed some recommendations that should be implemented immediately.

Alarm Systems

Following the incident and investigation, the alarm system in Graves Hall was linked to the Service Desk and is now fully operational with back-up power. ULAR met with Siemens to obtain an assessment of the cost of installing alarm systems in all of the ULAR vivaria and connecting those alarms that had been already installed but were not yet operational. Approximately \$1.3 million will be required to install alarms and make them fully functioning. Once installed, all alarm systems will be tested semi-annually to ensure full operational capability.

Modifications to Heating Systems

As described in the Summary, the Graves Hall HVAC was at the time of the incident connected in the fail "on" mode. This caused the introduction of heat in the building and consequently vivarium when power was restored. This problem has been corrected in Graves Hall so that the HVAC system is now in the fail "off" mode. The HVAC systems in all older buildings containing ULAR vivaria are currently being

October 10, 2006

inspected and will be reset in the fail "off" mode to prevent heating in the event of a future power outage and restoration.

Communication

There will be frequent communication between ULAR and Facilities, Operations and Development (FOD). The Service Desk will maintain a complete list of buildings on the campus that contain animal vivaria and the contact information for ULAR staff. At the time of the power outage, this information existed for only some of the animal facilities. Shortly after the Graves Hall incident, ULAR provided the Service Desk with a complete listing of all buildings that contain ULAR vivaria. This list will be updated semi-annually or more frequently in the event of animal housing changes. Unfortunately, information exists in an automated fashion for only newer facilities, and the Service Desk personnel must rely on hardcopy records of older facilities. FOD and ULAR should work together to remedy this problem as soon as possible. In addition, an automated log should be instituted to record calls to the Service Desk 24 hours a day. Currently, calls made to the Service Desk in the evening are not recorded. This will assist in tracking the communication chain between FOD and ULAR staff.

In addition to enhancements in communication from the Service Desk to ULAR staff, the team conducting the investigation agreed that ULAR, the Office of Research, Medical Center physical facilities personnel, and the College of Medicine Associate Dean for Research should meet at least bimonthly with FOD staff to discuss changes to infrastructure within buildings that house research animals.

Culture change

The Ohio State University is a comprehensive research institution and the animal care program is an integral part of our research mission. Leadership within FOD, ULAR and the Office of Research should promote a culture in which the health and well-being of our research animals are of paramount importance to the success of our research enterprise.

Restitution to the Principal Investigators who lost research animals

Resources will be provided by an equal distribution from the Offices of Business & Finance and Research and the College of Medicine to purchase new research animals for those investigators who had losses in the Graves Hall incident. The final cost-estimate is currently being assembled. Current projections are that the total cost of reimbursing Principal Investigators will be approximately \$161,000, excluding the alarm system upgrades.

Attachment

Table 1

Graves Hall Losses

P.I.	Room #	Department	E-mail	Total Animal #	Animal Type	Temp (°F)
Obrietan, Karl	Rm 139	Neuroscience	obrietan.1@osu.edu	338		101.3
Obrietan	Rm 141	Neuroscience		71		99.5
Gu, Howard	Rm 143	Pharmacology	gu.37@osu.edu	21	mice	99
Lin, Glen		Neuroscience	lin.492@osu.edu	26	mice	99
Kresty	Rm 145			"0" losses		97.7
Rafael-Fortney, Jill	Rm 147	Physiology/Cell Biol	rafael-fortney.1@osu.edu	4	mice	96.3
empty	149					
empty	151					
Janssen, Paul	Rm 153	Physiology/Cell Biol		"0" losses		99.4
Rall, Jack	Rm 155	Physiology/Cell Biol	rall.1@osu.edu	5	rats	100.6
Barth, Rolf		Vet. Biosciences	barth.1@osu.edu	66	rats	
Janssen, Paul		Physiology/Cell Biol	janssen.10@osu.edu	2	rats	
Jurkowitz, Marianne		Mol, Cell, Biochem	jurkowitz.1@osu.edu	12	rats	
Periasamy, Muthu		Vet. Biosciences	periasamy.1@osu.edu	4	rats	
Neff, Maria		Psychiatry	neff.6@osu.edu	1	rats	
Burghes, Arthur	Rm 157	Mol, Cell, Biochem	burghes.1@osu.edu	44	90 rats lost	
Bohn, Laura	Rm 159	Pharmacology	bohn.24@osu.edu	7	mice	99.2
Satoskar, Abhay		Mol Vir Imm & Med Gen	satoskar.2@osu.edu	21	mice	105.9
Whitacre, Caroline		Internal Medicine	whitacre.3@osu.edu	62	mice	
Yonushonis (sentinels)		Vet Prev. Med	yonushonis.1@osu.edu	4	mice	
Mangel, Stuart	Rm 161	Neuroscience	mangel.1@osu.edu	1	rabbit	101
Total:				689		