Business Continuity Planning Guide for Laboratories

Introduction: Research and teaching laboratories are critical to the mission of Yale University, its funding sponsors, and its many potential beneficiaries, present and future. Modern laboratories are highly infrastructure-dependent, and predicated on uninterrupted access to many complex support services. These include intact building envelopes, continuous climate control, utilities, transportation and delivery networks, core support facilities, information technology systems, special waste management and hazardous materials emergency response, and, of course, highly technically skilled people. Breakdowns in any one of these elements can cause serious disruptions to on-going research, and extended failures in some of these areas (i.e., loss of electrical power, fire, floods) may eventually lead to irreparable damages to equipment, infrastructure, and unique collections of samples and specimens.

This document provides an overview of key continuity of operations issues faced by the laboratory community. It is designed to aid Principal Investigators (PI's) in considering the additional protection and steps that should be taken to protect laboratory personnel and the valuable research being conducted. Although many of the elements are also common to academic teaching and support departments, some are highly specific to laboratories, and their successful preparedness requires specialized emergency resources and planning. Without putting some of these measures into place, the Principal Investigator and the University run the risk of severely or completely disabling – and ultimately even losing – unique research resources.

This process may seem like a significant project, it is meant to be taken one step at a time. This plan should become part of the lab's every day operations; the Business Continuity Plan (BCP) should be in readiness at all times. The PI should recruit a small team of people to help them build the plan.

Overall University Response- During an emergency, it is important to know the response structure at the University and that of the Yale Police, Local Police and Fire Departments. At the University, the President's Office will lead the overall University's efforts. If necessary, The President's Senior Advisor will activate an Emergency Operations Center (EOC) to help coordinate the response. An EOC is a location where departments such as Facilities, Dining, Environmental Health and Safety etc… come together to coordinate.

During emergencies, decisions need to be made quickly and efficiently. Decisions typically are made on the basis of the best information available, by persons in all likelihood not familiar with your research program and/or laboratory. It is highly desirable that you execute and maintain a comprehensive BCP so that your research interests are afforded the greatest protection possible in the event of an emergency. If a fully prepared BCP is not available for your laboratory, it is very possible that (1) decisions will have to be made before you are contacted and necessary to take actions that could impact those interests, or (2) you won't have sufficient time or opportunity to convey to decision-makers information that you believe is key to protecting your research interests before actions are taken that (again) could impact those interests.

As a potentially affected unit, you should also determine if there is an overall emergency plan in your department. If an emergency happens, you should know who it is that can help with resources to support the recovery of your laboratory.

Getting Started:

❒ Develop a team that can help you bring all the pieces of your plan together and help keep it updated and communicated to all the people who work in the lab.
❒ Updated/create the contact list of all employees, students and Post Doc's including cell phone numbers (24 hour contact)? Make sure that at the very least, your team has this information always accessible and available. (Appendix A- Laboratory Information)
❒ Review and download the information available at http://emergency.yale.edu/
❒ Define your essential functions (Appendix B- Essential Function) and build your plan around them.
❒ Does your department have an emergency plan? If they do, it may provide helpful information as you develop your BC plan.

Planning Considerations:

Imagine a fire that devastates the building, or a nor'easter that paralyzes New Haven or West Campus for 3 days or 50% of your staff is sick with the flu. What do you need to do to prevent a major disruption in research or the loss of valuable work that is being

conducted? Also, recognize that there is a distinction between planning what must occur to maintain active research and what must occur for the preservation and/or protection of equipment and research materials.

❐ Key Resources
  o Key Unit Staff- Envision your unit 1-3 days after a major emergency. You are calling together a group to plan how to resume operations. Who are the key people (staff or faculty) whose positions or knowledge might place them in that group? Resist the temptation to list all your staff under "Key People." The staff you should list here are the ones you would call upon first in time of crisis - who have the experience, skills, or authority to help "sort things out" and plan the next steps.
  o List of staff from other units who are the most important people from elsewhere on campus that your staff will need to contact within the first few days after a disruption, as you plan how to resume your essential functions.
  o Are there any external partners that your staff will need to contact within the first few weeks after a disruption, as you plan how to resume your essential functions?
  o Are there any external vendors that your staff will need to contact within the first few days/weeks after a disruptions, are you planning how to resume your essential functions? Please make sure that you have or get a 24 hour number that is actually answered by a person or ensures a prompt reply if a message is left.
  o Are there other stakeholders that your staff may need to contact after a disruptive event? For example - clients, project partners, donors, or sponsors?

❐ Vital Equipment
  o Do you have a list of the equipment in your lab?
    ▪ Include; key features, model numbers, cost, suppliers and 24 hour contact information.
    ▪ Identify utility requirements, noting special/non-typical requirements such as process chilled water, high voltage, three phase power, cryogenic liquid consumption rates, etc.
  o Of them, which are vital to maintaining the essential functions of your lab?
  o Which ones are on UPS or other back-up emergency power?
  o What would be the consequences of losing function of each piece of equipment? (i.e., loss of critical specimens)
  o Do you have a contingency plan for the loss of this equipment? (i.e., other freezer in other labs that you could use)
  o Do you have duplicate copies of drawings, diagrams, plans, or specifications of unique equipment or experimental apparatus in the event that the scientific equipment needs to be reconstructed?
  o What about the loss of the HVAC system? Do you have a contingency plan?
  o What mitigation activities could protect vital equipment?

❐ Vital Research Material
  o Does your laboratory have duplicate samples of novel compounds, specimens, etc.? If not, are there other Universities or research facilities that are conducting similar research? (Including collaborators and competitors as potential sources of information and re-suppliers of unique research materials.
  o Are irreplaceable specimens (animals, plants, cell lines, DNA etc.) copied/ duplicated and distributed to sites outside of your lab, New Haven or West Campus?
  o Of the supplies needed to conduct your research, do you have a list of those that are vital to your operations with 24 hour contact for the vendor? (i.e., food for animals, cryogen delivery, etc.).
  o Identify alternate sources as back-up to your primary suppliers, wherever feasible?
  o Would you consider increasing standing inventory of critical supplies? Especially those that typically rely upon just-in-time ordering.
  o What would you do if timely delivery is interrupted? Do you know how long of an interruption would cause irreparable damage to your research?
  o Do you have procedures for data storage and management?
  o What if your lab notebook or individual computer is lost or stolen?

❐ Building Evacuation:
  o Who is in the lab at the time of the evacuation?
  o Are experiments using chemicals safely shut down? How long the experiment can be left status quo before it can become dangerous?

- o Are they conducting an operations or procedure with an animal?
- o What equipment (if any) needs to be turned off or on?
- o Do any of the research materials or animals etc., have to be evacuated?
- o How long you can be out of the lab when it is left in mid-operations before the potential exist of losing critical equipment, experiments, animals etc.?

❒ Location inaccessible from 3 days and up to 2 weeks
- o Do you have a mechanism to contact your staff and provide regular updates?
- o Who in the building would you contact to advise them of the disruption if you are unable to access your lab in a certain amount of time?
- o What activities can you conduct on a daily basis to limit the effects of this disruption?
  - ▪ Daily inventory of supplies?
  - ▪ Daily list of chemicals being used at each work station?
  - ▪ Is you lab responsible for the delivery of critical supplies? If not, who is? Your department?

❒ 50% reduction in your lab staffing level:
- o Do you have a plan to decrease the activities of your lab yet maintain the operations of your critical functions?
- o Is your staff cross-trained to be able to conduct activities outside of their daily responsibilities?

❒ Complete Loss of your facility:
- o Can you resume operations elsewhere?
- o If not, what would you need to resume operations?
  - ▪ Equipment?
  - ▪ People?
  - ▪ Cell Lines?
  - ▪ Animals?
  - ▪ Plants?
- o Have you considered relocating graduate students, postdocs, and research with colleagues outside of Yale to continue research projects?
- o What plans can you have in place today that would help you reconstitute your operations elsewhere if the facility was lost?

❒ Training and Communications-
- o All staff should be trained uniformly in disaster and emergency preparedness and receive current documentation as needed.
- o Annual review of the BCP should occur. New information should be disseminated in a timely manner.
- o Essential staff should be cross trained to support all essential functions.
- o Essential staff should know where the plan is stored and it should be accessible to them at all times.

❒ Other considerations
- o Key information on grants- If you are unable to continue operating, how does this affect any grant or federal requirements?
- o Contact Grants and Contracts or Office of Research Administration to coordinate notification of regulatory and funding agencies.

❒ When you have completed your business continuity plan
- o Share with your team and department.
- o Review annually or any time there are major changes to your operations.

❒ For additional guidance and assistance contact: Stephen Woods, Business Continuity Program Manager at Stephen.Woods@yale.edu or (203) 432-8653.

A. Laboratory Information			
Principal Investigator:		24 hour Phone #:	
Email Address:			
Laboratory Manager/Contact:		24 hour Phone #:	
Email Address:			
Business Manager:		24 hours Phone #:	
Email Address:			
BCP Contact (Name):	Phone #:	Email Address:	Room & Building:
Laboratory Locations (Bldg/Rooms #s):			

Number of personnel: (headcount, approximation OK)
  Faculty and other academic appointees:
  Staff (full-time):
  Staff (casuals, excluding students):
  Student-staff:
  Volunteers:
  Residents/Fellows
  Guests:
  Other (explain below):

Staff Roster -

Employee Emergency Contact List - Do you have a list of people with 24 hour contact information that you would contact in the event of an emergency.

Evacuation Plans - Does you lab have an evacuation plan? Does your building? Do you know what it is?

Employee ID: Special Certifications/Training - This could include, First Aid, AED, EMT. Also include the employees that have 4-wheel drive in the event you need help transporting people into work due to inclement weather. Or employees that live nearby.

LOCATIONS of Lab and research -

Location of Unit EOC - An EOC is an Emergency Operations Center which is a technical term for a place that the laboratory would coordinate activity.

Alternate EOC -

Evacuation meeting site -

Location(s) occupied –

(Appendix B) Defining Essential Functions

Yale University's mission is to create, preserve and disseminate knowledge. Each college, division, and major administrative unit on campus exists in support of this mission. Each area performs functions that are essential to the ongoing success of the mission. The business continuity plan focuses on these essential functions. The identification and prioritization of essential functions is a prerequisite for business continuity planning. Examples of essential function include: hiring functions, grant management, regulatory/statutory requirements, payroll, public safety, etc.

It may seem an overwhelming task to look at all of the functions of your unit. As you are covering this very important topic, remember to focus on ONE function at a time. It is important that the team determines whether each function is a critical or noncritical function. Ask yourself: (1) Does this function support the mission of the University? (2) Would we focus limited available resources on this function, or would we focus elsewhere? (3) What dependencies are associated with this function? (4) If it is not tagged as a critical function, what would the consequences be? Then, assign a priority level, this will help you get started and prioritize your efforts and resources. Build your plan around your priority functions.

Definition of priority levels-

Priority	Recover Time	Description
Critical	< 4 hours	Directly impacts Life, Health, Safety, or Security. Cannot stop.
High	< 24 hours	Must continue at normal or increased level. Cannot pause without the potential for significant disruption and serious consequences.
Medium	< 1 Week	Must be continued if at all possible, perhaps in reduced mode. Pausing completely may result in adverse consequences. Must be restored
Low	< 1 Month	May pause if forced to do so, but must resume in 30 days or sooner for the University to continue functioning.
Deferrable	> 1 Month	May pause; resume when conditions permit.

Departmental Functions/Activities	Is this function vital to the operation of your laboratory? (yes/no)	Priority Level
1.		
2.		
3.		
4.		
5.		
6.		
7.		

Dependencies:

Instructions:
Here we answer the questions, "Who produces what we need?" and "Who needs what we produce?"

Please indicate on the chart below the departments (WITHIN campus) whose reduced functioning would seriously impair your laboratory/facility's ability to perform the above function.

Conversely, please also indicate those departments that would be seriously impacted if YOUR laboratory/facility could not perform the above function.

In other words, whom do you depend on (we call that dept. an upstream dependency), and who depends on you (downstream dependency)? For example, the ITS is typically an upstream dependency of most other departments.

These lists offer some common possibilities.

Upstream Dependencies	Downstream Dependencies
Accounts Payable	Student
Admissions Office	Staff
Campus Mail Service	Faculty
Dining Services	Instructional departments
Environmental Health and Safety	Research Units
Facilities	Accounts Payable
Financial Aid	Admissions Office
General Accounting Services	Dining Services
General Council	Environmental Health and Safety
HR	Facilities
ITS	Financial Aid
New Haven and State Affairs	General Accounting Services
Office of Development	General Council
Office of Federal Relations	HR
Office of Public Affairs	ITS
Office of the Secretary	New Haven and State Affairs
Parking and Transit Services	Office of Development
Payroll	Office of Federal Relations
Payroll and Compensation	Office of Public Affairs
Procurement	Office of the Secretary
Provost	Parking and Transit Services
Risk Management	Payroll
Security	Payroll and Compensation
Share Business Center, Finance and Business Operations	Procurement
Student Financial and Administrative Services	Provost
Yale PD	Risk Management
YARC	Security
YUHS	Share Business Center, Finance and Business Operations

Upstream Dependencies	Downstream Dependencies
	Student Financial and Administrative Services
	Yale PD
	YARC
	YUHS

b. Peak Periods

Periods of High Activity: Please indicate any <u>months</u> when you would expect there to be especially high activity involved in accomplishing this function. Identify as many months as needed. Explain if necessary. If this function has no peak periods, leave blank.

Also, try to envision trying to perform this function with 50% of your staff missing? Who would you do that?

c. How to Re-start

Instructions:
The following questions ask you to visualize the conditions that might prevail in the weeks or months following a disaster. You may be missing certain key resources such as your usual office space, some of your staff, power, network access, etc.

Please answer the questions below using one-to-several bullets or sentences each. Be brief. Give ideas, not detailed procedures.

Space: How would you carry out this function if your usual space is not available?	
Equipment: How would you carry out this function if, in addition to losing your space, you also lost ALL your equipment?	
Staff: How would you carry out this function if, for a couple of months, your average absence rate of faculty and staff were 50%? This could easily be the case in a flu pandemic. Does the successful performance of this function require the skills or knowledge of any one particular staff member (or their files)? If so how will you deal with their absence? Cross train a co-worker in advance? Outsource? Some other strategy	
Network Access: How would you carry out this function if the data network is not available	
Show Stoppers: Is there any resource that is so important or irreplaceable that you CANNOT perform this function without it?	
Risk: Will any of your above suggestions expose the University to risk? If so, can you suggest how to mitigate/control this risk?	
Policy Exceptions: What policy exceptions might be needed to carry out your above suggestions? Who would have the authority to grant them?	

Timing- To enable teaching, research, and/or service to resume as soon as possible, when must THIS function restart?	
Additional Vulnerabilities: is there anything ELSE that could prevent you from continuing or restarting this function?	

d. Vital Records

Please identify any documents that are very important to this function – whether they are individual documents (such as policy manuals) or sets of records (such as patient files, research files, or vendor invoices.) Do not include records that are stored within a database application such as a financial system, an HR system, a medical records system, etc. These will be treated elsewhere.

e. Consequences

Campus Closure: Visualize that during a flu pandemic the President declares the campus officially closed, with all operations (except pre-identified central critical service activities) to cease for at least a month. Is it possible for your unit to simply cease doing this critical function? Yes/No

HARMFUL CONSEQUENCES								
Suppose the essential function is not resumed quickly following a major disruption or disaster. Which of the listed harmful consequences might occur and how long after the disaster might the harm begin to occur?								
Possible Harmful Consequence	*How long after a disaster might the harm occur?*							
	N/A	0-2 Days	1 Week	2 Weeks	3 Weeks	4 Weeks	> 4 Weeks	Comments
1 Disruption of teaching?								
2 Disruption of research?								
3 Departure of faculty?								
4 Departure of staff?								
5 Departure of students?								
6 Well-being of staff/faculty?								
7 Well-being of students?								
8 Payment deadlines unmet by campus?								
9 Loss of revenue to campus?								
10 Legal obligations unmet by campus?								
11 Legal harm to the University?								
12 Impact on other campus unit(s)?								
13 Impact on important business partner(s)?								
14 Impact on Yale's brand image?								
15 Function Without Power?								
16 Other harmful consequence?								

f. Key Documents: Please list any supporting documents that should be attached to this plan.

g. Action Items Instructions:

An Action Item will answer the question: What can your unit do BEFORE ANY DISASTER STRIKES to lessen its impact on this function or will make it easier for you to continue/restart this function after a disaster?

The typical Action Item begins with a verb and can be stated in one sentence. Some examples:
- Back up document onto a data stick weekly.
- Develop a plan for secure storage of critical research materials.
- Cross-train staff to do department purchasing.

Action items are ideas, not commitments. So, think outside the box and don't feel constrained by resources. Some of your Action Items may need to be carried out by another unit. That is OK; the campus needs your ideas!

Space is provided below for four Action Items. Use additional sheets if needed.

Action Item #1: Description:	

Cost: (choose one)
   • less than $100
   • $100 - $1,000
   • $1,000 - $10,000
   • $10,000 - $100,00
   • More than $100,000
   • Don't know
 	
Cost is: (choose one)
   • one-time
   • annual
   • other
	Carrying out this Action Item is within the scope of: (choose one)
	   • my unit itself
	   • my unit together with other units on campus
	   • my larger department division
	   • the campus
	   • other
	
	Comment?

Action Item #2: Description:	

Cost: (choose one)
   • less than $100
   • $100 - $1,000
   • $1,000 - $10,000
   • $10,000 - $100,00
   • More than $100,000
   • Don't know
 	
Cost is: (choose one)
   • one-time
   • annual
   • other
	Carrying out this Action Item is within the scope of: (choose one)
	   • my unit itself
	   • my unit together with other units on campus
	   • my larger department division
	   • the campus
	   • other
	
	Comment?

Action Item #3: Description:	
Cost: (choose one) • less than $100 • $100 - $1,000 • $1,000 - $10,000 • $10,000 - $100,00 • More than $100,000 • Don't know Cost is: (choose one) • one-time • annual • other	Carrying out this Action Item is within the scope of: (choose one) • my unit itself • my unit together with other units on campus • my larger department division • the campus • other Comment??

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Key examples of vital equipment, operations and special collections:

- ❏ Highly specialized scientific equipment and operations
    - o NMR/MRI/other magnets requiring cryogens
    - o GC/MS, PET, EM, Confocal microscopes, irradiators, cleanrooms
    - o Glove Box(es)
    - o Solvent Purification Systems
    - o Incubators
    - o Refrigerators/Freezers
    - o -80 Freezer(s)
- ❏ Information resources (IT and paper)
- ❏ Samples and specimens (live, fresh, frozen, and fixed):
    - o Novel compounds and biochemicals
    - o Type specimens
    - o Cell lines
    - o Seeds
    - o Animals
- ❏ Specialized reagents and chemical inventories

Vital laboratory support functions include:

- ❏ Basic utility inputs of electricity, heating and cooling, potable water, sewage, and telecommunications
- ❏ Specialized utilities such as de-ionized water, process chilled water, and local exhaust
- ❏ Procurement, transportation, receiving, and delivery networks
- ❏ Uninterrupted vendor operations
- ❏ Service and maintenance on sophisticated equipment
- ❏ Special waste management services
- ❏ Emergency response services

A. Review the following basic good laboratory operating practices and ensure that they are woven into the working practices of your department or group:

i.   Laboratory security: Keep laboratories appropriately secure against unauthorized entry, theft, and vandalism. Keep restricted items (e.g., radioactive materials, research animals, controlled substances, select agents, highly toxic chemicals, and protected data) under applicable security controls; apply similar controls to items of unique, irreplaceable, or high dollar or effort value. Encourage staff to keep doors closed, and locked at all times when unoccupied. Further encourage staff to avoid working alone during odd/off hours, and to use campus security escorts. Politely challenge strangers, and immediately contact Yale Security (785-5555) or Police (911, 432-4400) of any suspicious behavior. For special hazards or highly vulnerable laboratories, contact Security Operations for a consultation.

ii.   Day-to-day laboratory management: Although the Principal Investigator (PI's) often does much of this work in smaller labs, as research groups grow in size and technical complexity, additional delegation and specialization becomes necessary. Nearly all labs should have a designed laboratory supervisor or manager, generally a senior staff member with broad knowledge and responsibility for on-going operations of the laboratory. All key equipment, services, and supplier relationships should be funneled through this individual, or a combination of this person plus the business administrator, any operations staff, and possibly other knowledgeable designees.

iii.   Equipment service and maintenance: Ensure that equipment warranties and extended service and maintenance contracts are in-force and kept up to date. Establish or adopt industry recommendations for routine calibration, testing, and preventive maintenance, and ensure they get done.

iv.   Refrigerators and freezers: Require periodic coil cleaning to maintain cooling efficiency as well as regular defrosting and related maintenance. Performing these on a regular basis can make the difference between long equipment life and catastrophic failure. Remember also to keep objects off of coiling coils, and to maintain required clearances for good air circulation through coils.

v.   Data storage and management: Begin with basics, such as the use of quality laboratory notebooks, indelible ink pens or pencils, secure locked storage for primary data sources, and avoiding potential water impacts. Protect against catastrophic computer data losses by ensuring a robust, redundant data management and storage system, and register all laptop computers. Contact Yale ITS (Central or Medical School as applicable) for additional advice and consulting assistance on this area.

vi.   Work area safety checks: Besides periodic institutional safety surveys and inspections, all laboratories are encouraged to routinely check their own work areas for potentially dangerous conditions, such as blocked exit doors, improper storage of materials, frayed electrical cords, overloaded circuits, poor housekeeping, or inadequate emergency supplies. Ensure that fire extinguishers are present and kept readily available, and that evacuation routes and assembly areas are posted - contact the Yale Fire Marshal's office if postings are outdated or need to be installed. Keep areas around emergency eyewashes and showers clear and accessible as well. And finally, keep lab safety identification cards up-to-date.