

Keeping the Doors Open: Emergency Preparedness and Business Continuity Planning for Shared Resource Core Facilities

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ADVANCED RESEARCH TECHNOLOGIES

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NYU GROSSMAN SCHOOL OF MEDICINE



Shared Research Resource Core Facilities (SRR) Are Key to Research Resilience

- ▶ Large institutional investment in expertise and instrumentation
- ▶ Large institutional investment in infrastructure
- ▶ Researchers and granting agencies recognize importance of SRR for support of increasingly complex scientific instrumentation and required expertise
- ▶ Ensuring SRR can operate following emergencies is efficient method to help institution recover research capacity

Some Definitions

- ▶ **Shared Research Resources (SRRs)**
 - ▶ enable cost efficient sustainable access to advanced technologies and scientific expertise that have accelerated research for over 40 years
 - ▶ are the nexus for promoting interdisciplinary projects and teamwork, and research rigor and reproducibility.
 - ▶ SRRs are data generators and ensure data provenance.
 - ▶ Highly successful R1 institutions leverage SRRs to achieve institutional goals for research funding awards, faculty recruitment and retainment and scientific reputation.
- ▶ **DART:** Division of Advanced Research Technologies is responsible for NYU SRR, dedicated to facilitating basic, clinical, and translational research.

Some Definitions

Emergency:

An immediate threat to

- ❑ the health or safety of individuals within the university facilities/grounds

or

- ❑ the integrity of the university physical plant or grounds.

Disaster :

- ❑ a natural or man-made event that disrupts the physical plant, grounds and/or operation, or loss of utilities-power, water, telephones, computers.
windstorms, earthquakes, tornadoes, hurricanes, floods
- ❑ events that prevent the organization from carrying on normal business operations (
civil disturbances, accidents/emergencies within the surrounding community, acts of war or terrorism
- ❑ sudden and significant change in demand for the organization's services (bioterrorism attacks or building collapse).
- ❑ events or perceptions that preclude the normal flow of communication and/or leadership within the community.

BUSINESS CONTINUITY:

Steps to manage recovery from disasters and continue to conduct essential operations under extreme circumstances

MITIGATION:

Defined sustained actions taken to reduce or eliminate long-term risk to life and property from hazards

RECOVERY:

Actions taken to return to a normal or an even safer situation following an emergency

PREPAREDNESS:

A continuous cycle of planning, evaluating, and taking corrective action in an effort to ensure coordination during incident response

RESPONSE:

Containing damage, preventing (further) loss of life or injury to personnel or property, and restoring order in the immediate aftermath

of an incident



Developing a Disaster Plan



- ▶ “All Hazards” – NIMS or FEMA approach
 - ▶ Establishes generic responses to consequences
 - ▶ Identifies and establishes procedures for first responders
 - ▶ Serves as guidance for institutional leadership
 - ▶ Designed to be workable
- ▶ Incident Command Structure

Uses existing framework and personnel for decision-making

Specific responses are determined by an on-scene situational evaluation with input from key and external responders
- ▶ Supported by all individual departmental plans

Disaster Plan Elements

- ▶ Notification and communication
- ▶ Activation of the plan and command structure
- ▶ Guidance for decision makers
- ▶ Roles and responsibilities for first responders and decision makers: *WHO does WHAT*
- ▶ Identification of essential personnel: *Assign and ensure they know they have essential responsibilities*
- ▶ Security and traffic control
- ▶ Coordination of medical care & the relief information center
- ▶ Public relations and Internal communications
- ▶ Evacuation procedures
- ▶ Return to normal operations
- ▶ External disasters – impacts and role of the University
- ▶ *Regular review, evaluation and training (at least annually)*

Principle roles and responsibilities for SRR are similar:

- ▶ Appropriate evacuation and accounting for SRR staff
- ▶ Securing SRR laboratory prior to evacuation
- ▶ Implementing procedures/systems for critical document/data backup and/or retrieval
- ▶ Shutdown and securing of instruments, equipment and hazardous operations

Continuity Planning

How will you operate if key staff, facilities, utilities and/or materials are interrupted and not available for an extended period?



Your main goal is to **maintain business operations.**

Look closely at what you need to do to deliver prioritized services and functionality

Evaluation Tools

- ▶ **Audit** *(review annually)*
 - ▶ Utilities used (affected by shortage/interruption)
 - ▶ Staffing levels and responsibilities
 - ▶ Tasks that can be handled remotely
 - ▶ Critical supplies inventory and consumption rates
 - ▶ Instrumentation maintenance programs and service plans
 - ▶ Space amenities (any events that could leave space unusable)
 - ▶ Risk of lost records or documents
- ▶ **Establish priorities**
- ▶ **Focus first on core only interruption**, then expand to address institution-wide event or even community/regional event

Staffing Needs Evaluation - Example

HTSRC Critical function/service	Effect of staffing shortage/staff expertise absence	Mitigation actions
1. HTS compound plate delivery	slower throughput/screening halted	A) Three staff members know operation B) SOP written/vendor can operate
2.NMR guidance	no new users can be trained	A) consulting arrangements w/ MUA B) consulting w/use at external partner
3. Instrument Use/guidance	slower operations, users must self rely	A) redundant staffing B) SOPs and vendor consulting possible
4. Assay development guidance	slows scientific progress	A) online guide written B) redundant staffing
5. Compound picking	screening halted	A) 3 staff members know operation B) SOP written for user training
6 Library reformatting	screening	A) 3 staff members know operation B) SOP written for user training

Utility Needs Audit - EXAMPLE

Flow Cytometry Resource Center

Service/Process	Electricity	Natural Gas	Exhaust ventilation	Refrigeration	Compressed air (house)	Vacuum (house)	Water	Intranet	Internet
Cell sorting	Yes	No	Yes	Yes	No	No	Yes	Yes	No
FACS analysis	Yes	No	Yes	Yes	No	No	Yes	Yes	No
Image-Stream	Yes	No	Yes	Yes	No	No	Yes	Yes	No
Training	Yes	No	No	No	No	No	No	Yes	No

Key Elements for Continuity Plan

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- List of prioritized responsibilities and/or services
- Identification of critical infrastructure
- Documented SOPs
- Cross training
- Critical vendor and support service contact information
- Procedures for notification of users
- Alternate sources – of your services; for your supplies
- **Mutual aid agreements**
- Status review and reporting

Identifying Resources

Internal

- ▶ Which other SRR have complementary expertise, equipment, supplies?
- ▶ Which labs on campus have these?

External

- ▶ Do other institutions in your area provide similar services?
- ▶ What commercial options exist for your users?

LESSONS FROM SUPERSTORM SANDY

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Disaster and Contingency Planning

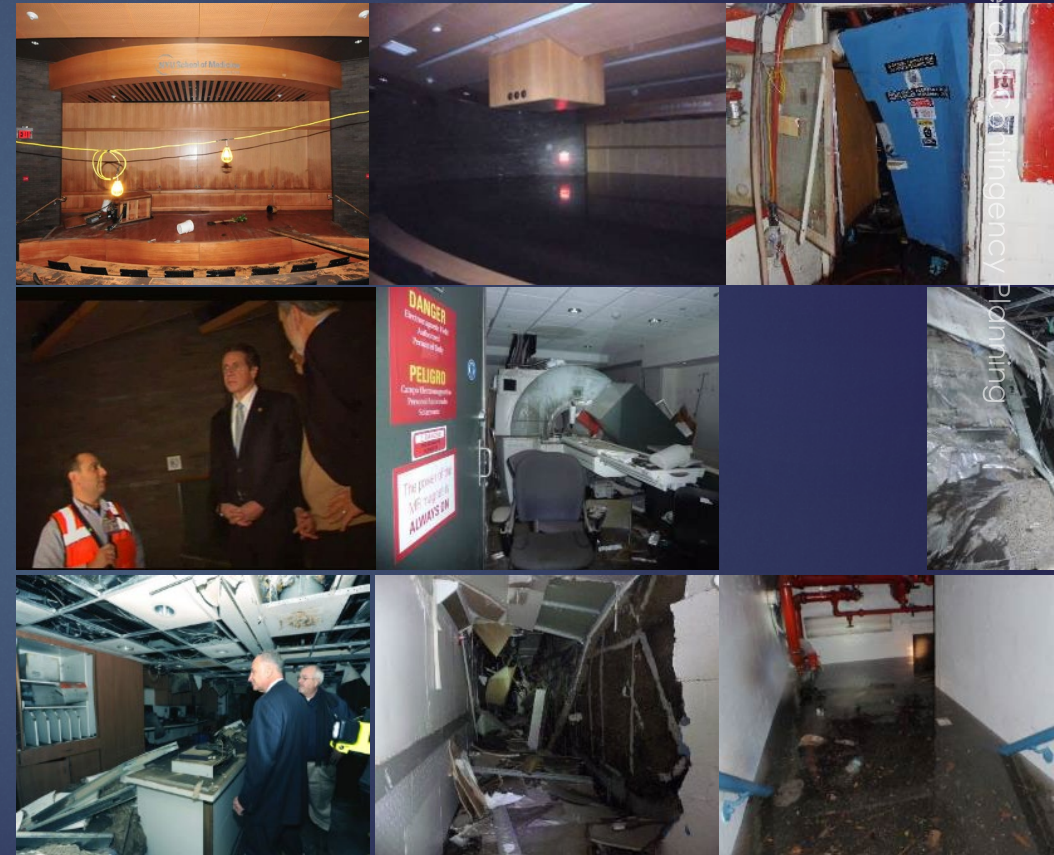
*...or how to embrace chaos
as a competency*



A Defining Moment: Superstorm Sandy 2012

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- ▶ Total cost of ~\$1.4 billion in lost revenue, facilities, equipment, and research for NYU Langone
- ▶ 751 lines of unique GM animals
- ▶ Utility services disrupted
- ▶ Full patient evacuation
- ▶ Main campus closed for 2 months
- ▶ Relocation of Research ongoing for > 1 year
- ▶ Rebuilding >10 years
- ▶ Reputational impact



Disaster
Emergency
Agency
Planning

Research Recovery was a **staged** process

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Disaster and Contingency Planning



1. Responding to immediate needs
2. Documenting losses
3. Systematically replacing losses

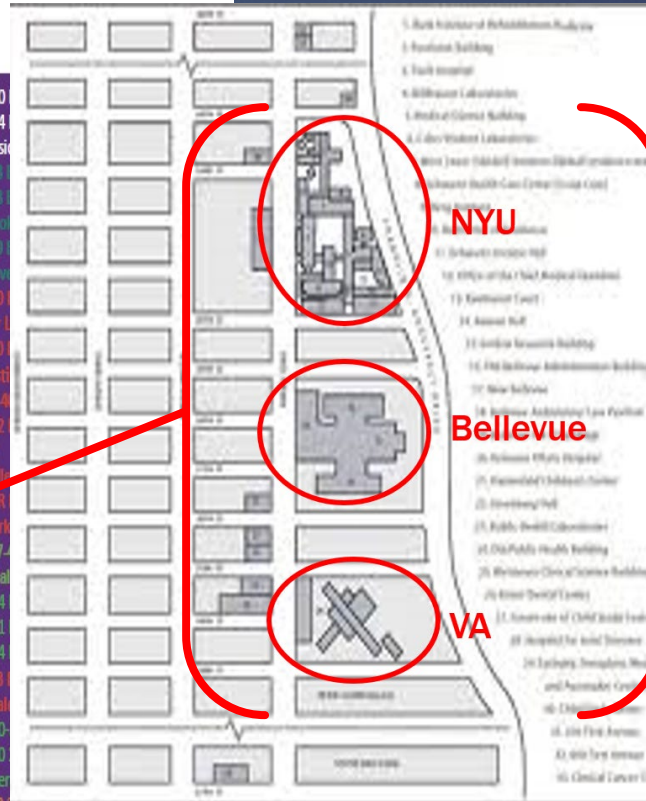
IN 2012 NYU LANGONE PRESENTED MANY LOGISTICAL AND OPERATIONAL CHALLENGES...

NYULMC LOCATIONS MIDTOWN MANHATTAN



- 32. Affinia Shelburne
- 33. 240 E 38th St, Ambulatory Care Center
- 34. 345 East 37th St, Medical Office
- 35. 333 East 38th St, Center for Musculoskeletal Care
- 36. 339 East 38th Street, Outpatient Surgery
- 37. 660 First Ave, Center for Biomedical Imaging
- 38. 650 First Ave, Medical Offices
- 39. 1 Park Ave, Medical Offices
- 40. 141 East 33rd St, Apartments
- 41. 225 East 34th St, Charleston Condos
- 42. 245 East 35th Street, Medical Offices
- 43. 317-23 East 34th Street, Center
- 44. 300 East 34th St, Apartments
- 45. 305-307 East 33rd St, Institute of Reconstructive Plastic Surgery
- 46. 577 First Ave, Avalon
- 47. 401-403 East 34th St
- 48. Newport Block 962 lot 999, parking lot
- 49. 550 First Ave, Tisch Hospital
- 50. 545 First Ave, Greenberg Hall
- 51. 227 East 30th Street, Translational Research Bldg
- 52. 215 Lexington Ave, Medical Offices
- 53. 145 East 32nd Street, Clinical Genetics Services
- 54. 150-160 E32nd Street, Hassenfeld Children's Center
- 55. 155 East 31st St, Medical Offices
- 56. 150 East 32nd St, Maternal Fetal Care Center
- 57. 419 Park Ave, Obgyn Associates
- 58. 37 East 28th St, Apartments
- 59. 360
- 60. 104
- 61. 323
- 62. 333
- 63. 339
- 64. 430
- 65. 450
- 66. 10-4
- 67. 462
- 68. Bell
- 69. 327
- 70. 327
- 71. 334
- 72. 341
- 73. 334
- 74. 423
- 75. 320
- 76. 380
- 77. 359 2nd Ave, Initiative for Women with Disabilities
- 78. 246 East 20th St, Seligman Center for Advanced Therapeutics
- 79. 305 2nd Ave, Rutherford Place
- 80. 80 5th Avenue, Medical Offices

- LEGEND**
- EVACUATION ZONE 1
 - EVACUATION ZONE 2
 - EVACUATION ZONE 3
 - EVACUATION ZONE 4
 - EVACUATION ZONE 5
 - EVACUATION ZONE 6



1200 freezers with 1M+ biospecimen distributed among 3 medical centers in Manhattan

...to protect the three key repositories

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1. Data
2. Freezers
3. Unique / GM animals



Recovery phase may be longer than you expect



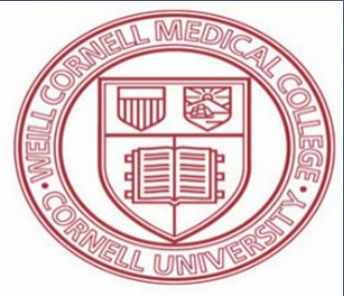
- **Relocated**
 - 1M+ biospecimen
 - 800 scientists and staff
 - 90 research labs
 - 9 core labs
 - 14 departments
- **Restored** two of the Medical Center's three primary research facilities (Smilow and Skirball)
- **Re-established** relocated labs and staff back to campus
- **Rebuilding...**

Priority: Core recovery *the lifeblood of NYU Research*

- Adapted a **distributed model** of SRR to meet demands of relocated scientists
- 50% of NYU Langone SRR were providing services **within 2 weeks post-Sandy**
- **86%** were operational 1 month post-Sandy
- **Dependent on Essential Partnerships**



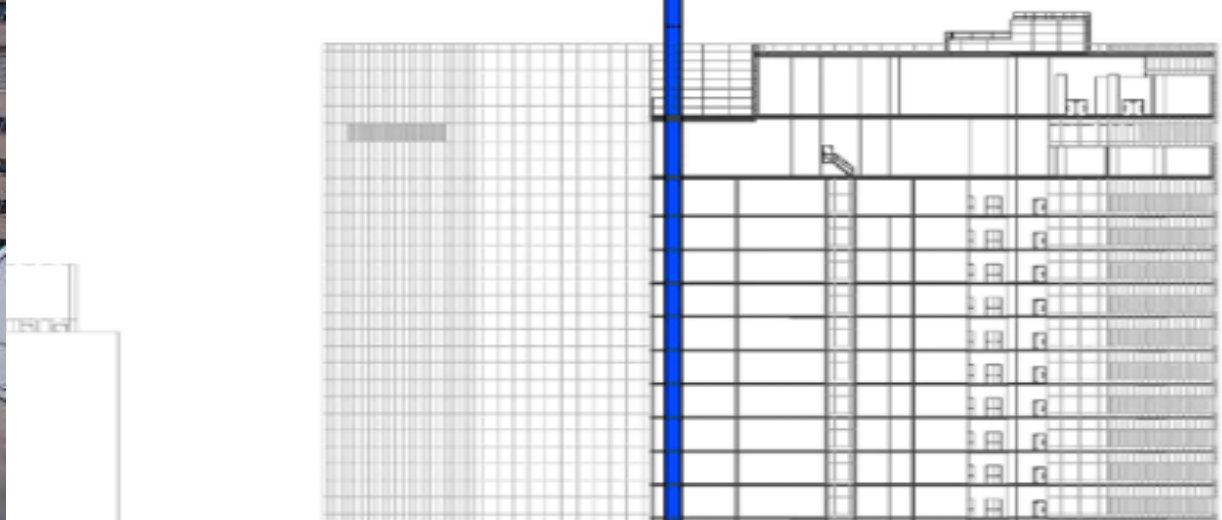
Essential partnerships with our neighboring institutions



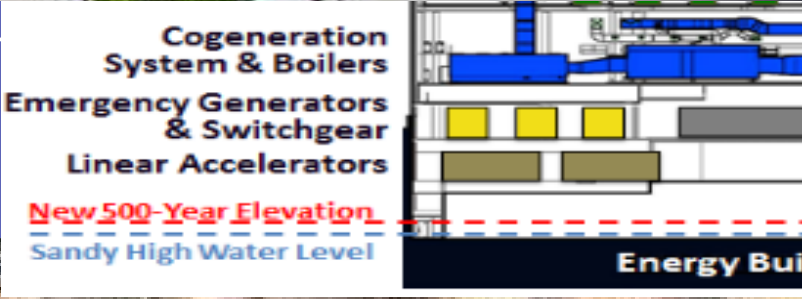
NYU Langone's Approach to Infrastructure Resiliency



ure, Patient Care



Continuity plan



NYU Langone TODAY: Implement Recommendations From NAS Report For Research

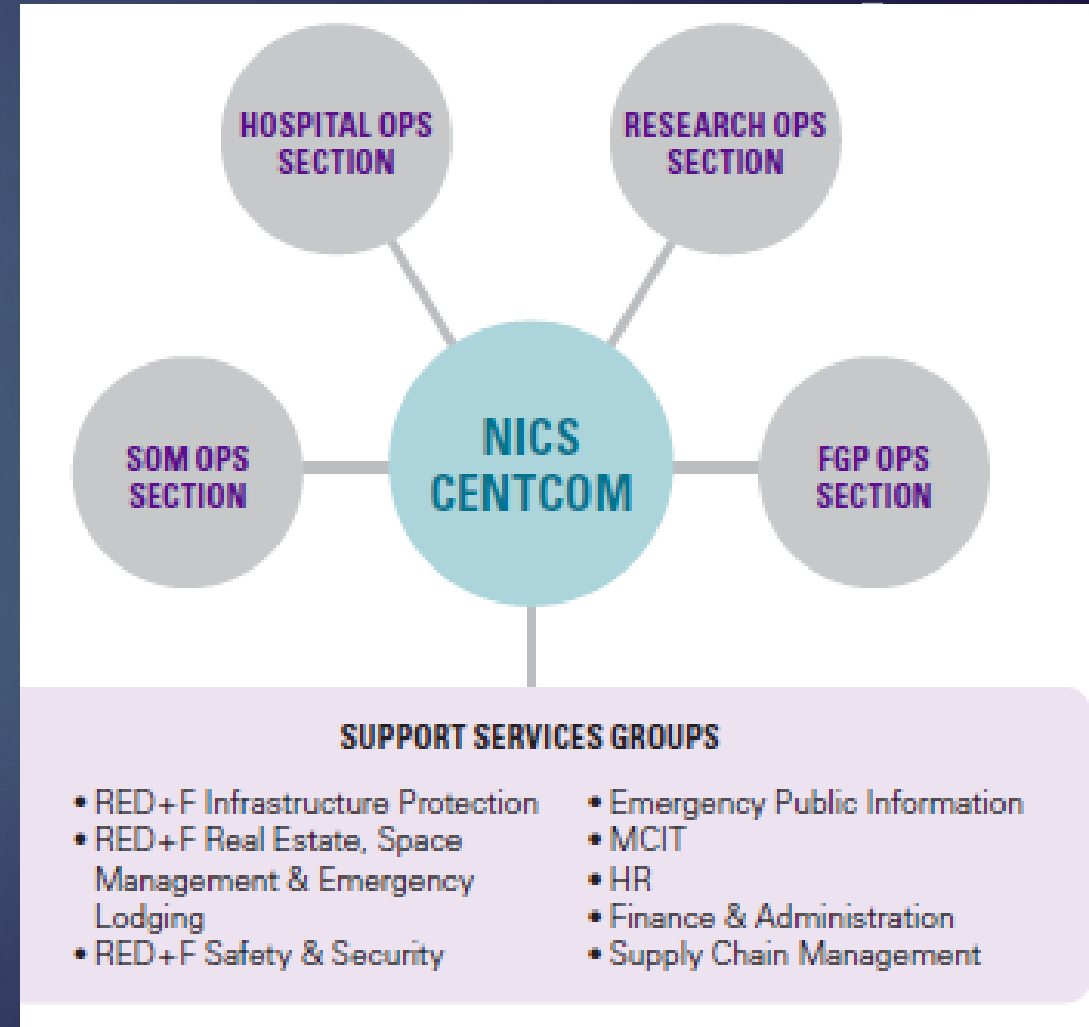
- Chief Resilience Officer: handle contingency plans for various scenarios and institute mandatory training for staff to prepare them for emergencies
- Researchers should take responsibility for protecting their own work by ensuring that the most critical data, samples and resources are duplicated and stored at other locations
- Institutions re-evaluate whether their current risk assessments are accurate in the light of threats such as climate change
- NIH should do more to help pay for equipment and infrastructure redesigns and preparedness efforts

Business continuity and disaster response is an **institutional-wide endeavor**

Incident Command Structure (NYU Langone Emergency Management & Emergency Response)

- Uses existing framework and personnel for decision-making
- Specific responses are determined by situational evaluation with input from key responders

Supported by all individual departmental plans



Adopted 5 day preparation cycle for all incidents

ASSUMPTIONS

- The plan assumes a broad loss of power, at least temporarily concurrent with onset of storm
- All NYU Langone facilities will comply with mandatory Evacuation Orders
- No deliveries 24h pre landfall, 96h post storm

Daily Objectives for Storm Preparation

Days before storm	Operational Objectives	Hours before storm
5	Activate the EOC, begin preparedness activities	120-96
4	Just-in-time training, review readiness	96-72
3	Initiate key operational tasks	72-48
2	Complete key operational tasks	48-24
1	Final checks and prepare for storm onset	24-0
Zero Hour <i>Arrival of tropical storm-force winds</i>		
0	Assess damage and initiate recovery	0

DART* SRR Disaster Plans

- ▶ Specific to DART SRR
- ▶ Support and are supported by the NYU Langone plan
- ▶ Define the roles and responsibilities of the core and members of the core for disaster planning and response activities
- ▶ Appropriate evacuation and accounting for staff
- ▶ Securing core prior to evacuation
 - ▶ Implementing procedures/systems for critical document/data backup and/or retrieval
 - ▶ Shutdown and securing of instrumentation / equipment and operations

*Division of Advanced Research Technologies (DART) oversee the core research laboratories

NYU DART CORES: FORMALIZED AND INTEGRATED EMERGENCY PLAN DOCUMENT

- ▶ Core & Director name, contact information
- ▶ List of core staff: roles/responsibilities
 - ▶ Contact information sheet for all staff
 - ▶ Do you anticipate commutation problems?
- ▶ STAY Team Roster:
 - ▶ list of essential core scientific staff who will be housed on campus during the disaster and/or will be permitted access to the core to assess and initiate recovery
- ▶ SAFER Team instructions for monitoring during the event:
 - ▶ specific for each core instruments, equipment, reagents, cold storage...
 - ▶ In the event of a shutdown, what are the anticipated issues?
- ▶ Minimum operational requirements
 - ▶ *if your lab had to be relocated...*
- ▶ Mutual aid agreements

DART Checklist for creating Emergency Plan Document

- ▶ 4 Step Process – ongoing and reviewed often
- ▶ List of instruments, equipment with location
- ▶ Identification of critical infrastructure
- ▶ Minimum operational requirements *(if your lab had to be relocated...)*
- ▶ Mutual aid agreements
- ▶ Documentation
 - ▶ Critical vendor and support service contact information
 - ▶ Documented SOPs
 - ▶ Alternate sources of services, supplies

STEP 1: Prepare an inventory

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Instrumentation / equipment

- ▶ Vendor Name
 - ▶ Description
 - ▶ Make/Model #
 - ▶ Serial #
 - ▶ Asset Tag #
-
- ▶ Equipment photographs: establish proof of ownership



****Annual Review / Update**



STEP 2: Photograph Inventory

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Disaster and Contingency Planning

- Valuable Consumables/Supplies
- Vendor Name
- Description, including quantity of reagents in containers
- Lot #
- Expiration Date (Shelf life)

Consumable photographs should illustrate quantities clearly as listed within the inventory (*important for establishing reagents/supplies on hand*)



STEP 3: Documentation

Keep a copy of other supporting documentation to prove ownership:

- ▶ Invoices
- ▶ Purchase Orders* + NYUMC asset tag #
- ▶ Maintenance Logs
- ▶ Service Contracts*
- ▶ Warranties...

**Maintain centralized documentation for POs, service contracts*

ongoing

STEP 4: Back-up Inventory

- ▶ Back up all the inventory lists, supporting documentation and research data to electronic files
- ▶ Store copy in an alternate location that will not be vulnerable to the disaster, and accessible!

DART CORE FIVE DAY COUNTDOWN

- ▶ DAY 5
 - ▶ Take stock of inventory
 - ▶ Instrument Status
 - ▶ Data analysis/management
 - ▶ Samples
 - ▶ Reagents and supplies

- ▶ DAY 4
 - ▶ Ensure critical equipment/instruments powered by e-power
 - ▶ Plans for shutdown of equipment in event of power loss;
 - ▶ Consolidate cold storage items to e-power
 - ▶ freezers/refrigerators
 - ▶ LN2 or off-site storage
 - ▶ Reserve LN2/dry ice requests (if needed)
 - ▶ Review projects in process: completion or stabilized
 - ▶ Initiate first email to customer list regarding initiation of 5 day countdown

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DART CORE FIVE DAY COUNTDOWN

- ▶ DAY 3
 - ▶ Alert customers/users of core preparedness planning and shutdown steps taken regarding sample/data preservation
 - ▶ Postpone start of any new projects
 - ▶ Focus on completion, data management
- ▶ DAY 2
 - ▶ By 36h complete all preparedness activities including instrument shutdown
 - ▶ Take delivery of dry ice, LN2 (if requested);
 - ▶ Implement procedures/systems for critical document/data backup and/or retrieval
 - ▶ Ensure laboratory is stabilized with respect to INSTRUMENTS, REAGENTS, COLD STORAGE, DATA
- ▶ DAY 1
 - ▶ Shutdown and securing of all instrumentation/equipment/operations

Daily Objectives for Storm Preparation

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Create a Resilient Community

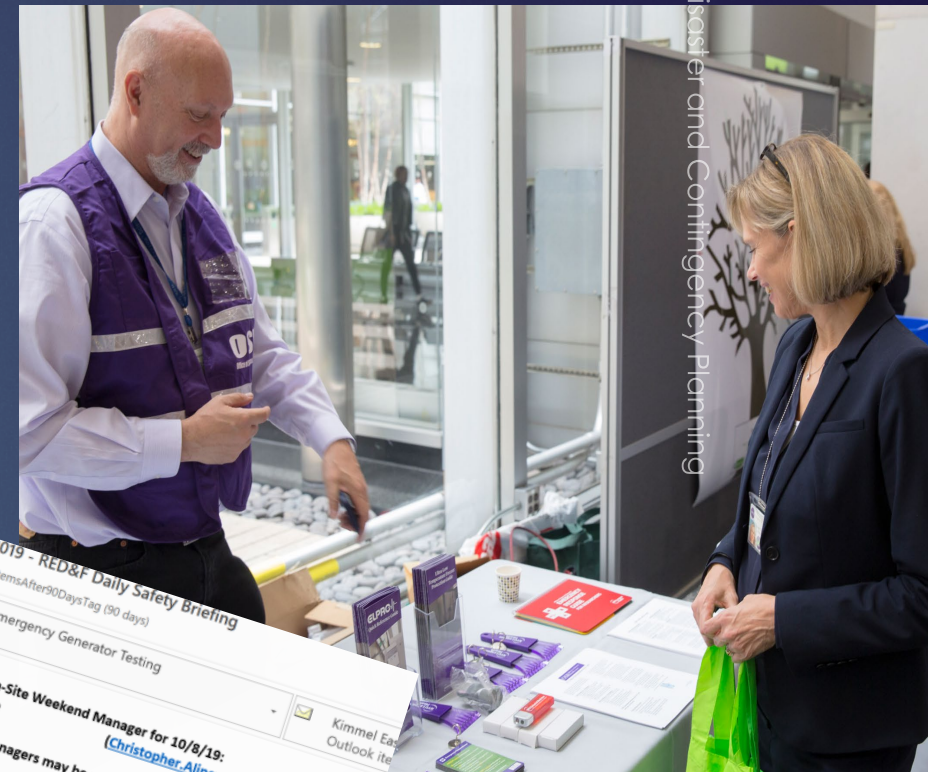


- ▶ Staff Preparedness
 - ▶ SAFER (Safety Assistants For Emergency Response) team
 - ▶ Responsible for assessing research spaces and reporting critical information to OSR leadership.
 - ▶ SOS team (“Scientists on Standby”).
 - ▶ Resource to first responders (internal and external) about potentially above-average hazards (e.g., radioactive waste storage room)
- ▶ Annual Protocol Review and Exercise
 - ▶ Operationalizing Mitigation Efforts
 - ▶ Understand Business Implications
 - ▶ Disaster simulation exercise:
 - ▶ Communications (OSR), Research Lab Operations, DCM, Sackler, High-Containment Labs, DART/Core Labs, Clinical Research, Investigational Pharmacy, Supply Chain, and Facilities (offsite)

NYU Langone lives resiliency daily

And COMMUNICATES OFTEN!!

- !NYULH Alert! for 1st Call Roster
- Facilities Daily Safety Briefing
- Facilities On-site Weekend Managers
- Emergency Generator Testing
- Research Resilience for long holiday weekends



Disaster and Contingency Planning

Research Resilience for the Fourth of July Holiday

Dear Research Community,

With the approach of the July 4th holiday this week, we ask that the research community take the following simple precautions:

- Verify that liquid nitrogen cryotanks have sufficient LN2 supplies through the weekend.
- DO NOT overload circuits—only one piece of major equipment per duplex outlet.
- Confirm that you have accurate contact information (home and/or cell phone numbers) for everyone in your research group, and that this information is readily available at home and at work.
- Know who in the lab will be available to respond to an emergency, should one occur.
- Label your freezer(s) with emergency contact information using the [OSR ULT Freezer Label Template](#) (i.e., PI Name, emergency contact phone number, and secondary contact person and phone number) in case someone needs to care for the freezer contents in your absence.
- Backup all data from your desktop, laptop, and/or tablet computers. If you don't currently have an automatic backup system, consider installing the Code42 CrashPlan application, available by submitting a ticket on the [MCIT Support Page](#).
- If you have samples monitored by ELPRO and are on the ELPRO responder list, verify that you can access the ELPRO app from an offsite location.

Thank you for your cooperation.
Regards

Retention Policy NYULMC - PurgeDeletedItemsAfter90DaysTag (90 days)

Sunday October 8, 2019 - RED&F Daily Safety Briefing

RE: PLEASE READ: October 2019 Emergency Generator Testing

Outlook item

The Facilities Operations Management On-Site Weekend Manager for 10/8/19:
Sunday, 10/8/19: Christopher Alincastre
(Christopher.Alincastre@nyulangone.org)

Facilities Management On-Site Weekend Managers may be reached by calling 212-263-5275.

General:

- No Safety Issues:
- No Utility Issues:
- Fire Safety Alerts: [Science Building Fire alarm command center activated- Saturday 10/7/19 @ 3:30pm](#)
[pressurized. All clear system reset @ 3:50pm](#)
- Elevator Issues:
[@ NYULH-Smlow Freight Elevator 545 is out of service undergoing repairs. We expect it](#)

Kimmel East Outlook item

Lessons Learned

- Embrace opportunities to change
- Support resiliency and climate preparedness beyond industry standards
- Change current and future master planning & design
- Solidify commitment to energy efficiency and reduction
- Build a culture of resiliency and collaboration
- Focus on emergency preparedness and business continuity planning

Questions?