NEGATIVE PRESSURE ISOLATION SITE:
EMERGENCY OPERATIONS PLAN
NOVEMBER 12, 2007

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EXECUTIVE SUMMARY:

Hospital and healthcare providers may be faced with the emergent need for the isolation of a large cohort of patients/victims due to infectious disease outbreaks or other Chemical, Biological, Radiological or Nuclear (CBRN) events. To meet this need, specialized planning, organization and protection of employees is required. The development and operation of a SURGE ISOLATION UNIT (SIU) at St. Luke's Hospital & Health Network is a location which meets this need.

The St. Luke's Hospital & Health Network SURGE ISOLATION UNIT is a 40-bed capacity SIU integral and internal to the facility.

This Emergency Operations Plan (EOP) describes the development and operation of the unit on the fourth floor (NW) of the St. Luke's Hospital & Health Network, Bethlehem, Pennsylvania site (St. Luke's). The St. Luke's Hospital Incident Command System (HICS) manages the unit, which can be established with a 12 hour lead time. This plan meets the requirements of the National Incident Management System (NIMS) and compliance is so certified.

I. INTRODUCTION:

A. Purpose:

The purpose of the Surge Isolation Unit (SIU) at St. Luke's is to provide an area in the facility which can be rapidly developed through in-house personnel and equipments into a Negative Pressure Enclosure (NPE), while maintaining an appropriate environment of care.

B. Scope:

The scope of this procedure covers the area, equipments, deployment and development of the physical site, employee protection and maintenance of the environment of care for the 40-bed SIU on the fourth floor (NW) of the St. Luke's site. It identifies internal and external communications and notifications necessary to initiate operation/use and interplay with the Hospital Incident Command System (HICS) for the emergent event. Employee protection during SIU operation is covered in this plan. Finally, decommissioning and return to normal use procedures for the area are identified.

II. POLICIES: (RESERVED)

III. SITUATION/ASSUMPTIONS:

A. Situation:

The SIU at St. Luke's will be used for the care and medical management of patients with infectious diseases , CBRN contamination/exposures and other situations as designated by the St. Luke's HICS Team. It provides in-house, surge capabilities for 40 victims/patients within an NPE system.

B. Assumptions:

The following assumptions apply to the development of the SIU at St. Luke's:

1. The unmet need requiring the development of the SIU cannot be addressed by other licensed components of the St. Luke's system (e.g. typical negative pressure isolation rooms).

2. The need for staffing of the SIU will be met by the provision of trained St. Luke's staff (i.e. outside assistance is unavailable, although emergency partners may be utilized).

3. The need for SIU operation may present for a timeframe of 10-14 days.

4. A 12 hour lead time is requested/suggested for development of the SIU, by St. Luke's staff, which will occur at the direction of the Hospital Incident Command Team.

5. Care for approximately 40 individuals can be provided in this area[1].

6. Staff Personal Protective Equipment (PPE) will be used as a tertiary mechanism for employee protection while operating the SIU, with engineering (negative pressure enclosure) and administrative (restriction of area access) controls used as the primary means for St. Luke's employee protection.

[1] Note: A negative pressure isolation site for approximately 20 individuals may be developed using ½ of the area, i.e. by closing and sealing the fire doors in the middle of the fourth NW floor.

IV. CONCEPT OF OPERATIONS:

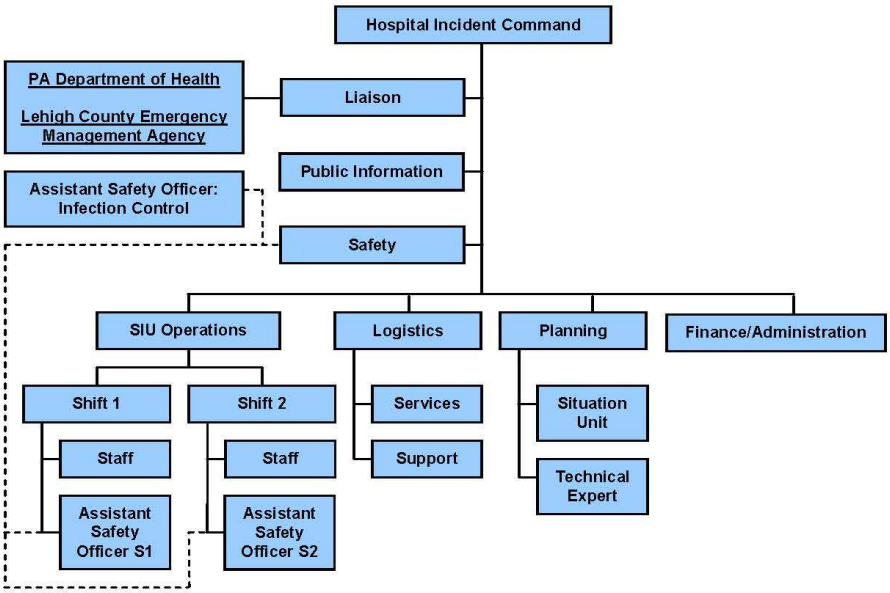
The St. Luke's SIU will be developed on the fourth floor (NW) area[1] of the facility (See Appendix A: St. Luke's Fourth Floor NW: Floor Diagram). When an emergent need presents, the following will occur to activate the SIU:

A. General:

1. Any request for the SIU will be directed by the HICS Team and the hospital Emergency Operations Center will be activated during its operation. The SIU will be under the control of an Operations Branch in the HICS. The command and control structure for the management of the SIU is described in Table I, below.

2. A minimum of 12 hour lead time is requested for the development of the SIU.

TABLE I
ST. LUKE'S SIU: COMMAND AND CONTROL STRUCTURE



3. An Action Plan will be developed/briefed for each shift of SIU operation. The HICS Planning Section, in concert with Technical Experts, will develop the plan and present plan contents prior to the initial shift of SIU operation and subsequent shifts, as appropriate.

4. The HICS Liaison Officer will notify PADOH (Office of Public Health Preparedness: Emergency Planning Liaison Officer [EPLO] through the State Emergency Operations Center [SEOC] at 717-651-2001) and the Lehigh County Emergency Management Agency at the time of SIU development. A county or PADOH Liaison may be requested, at the discretion of the Incident Command Team.

5. The Public Information Officer's duties for the unit may be assigned to the hospital PIO, at the discretion of the HICS Team. A notification/press release will be developed for distribution upon approval of the HICS Team, when the SIU is activated. The PIO will contact the Lehigh County PIO and PADOH PIO upon unit activation.

6. A Safety Officer for the deployment will be identified. Additionally, **Assistant Safety Officers (ASO) will be assigned to each shift of SIU operation, and an ASO: Infection Control, will be assigned.**

7. The general staff positions of Operations Section Chief, Logistics Section Chief, Planning Section Chief and Administration/Finance Section Chief will be assigned for each SIU activation. **Logistics personnel (Support Branch) will be available/on duty for each shift of SIU operations.**

B. Site Development:

SIU site development will occur as follows (See Table II: St. Luke's Isolation Unit Site Development and Operation Flow Chart):

1. Site development will occur under the direction of the Logistics Section Chief.

2. Office and room occupants of the fourth floor NW area will be notified prior to activities occurring, and will remove all personal items from the fourth floor (NW).

3. Logistics staff will check and perform appropriate preventative maintenance at medical gas locations, lighting and communication equipments on the fourth floor (NW). All soft surface items will be removed from the area (e.g. carpeted areas will be removed for sanitation purposes).

4. Logistics staff will move beds/medical equipments to the SIU as directed by the Incident Command Team. (Note: This will occur prior to any containment activities).

5. An area sanitization will occur as directed by the HICS Team, prior to NPE installation. Sanitization and housekeeping will occur on each shift, and on a schedule approved by the Safety Officer.

6. Logistics staff will ensure the floor HVAC system is operating in a 100% outside air exchange mode and install (X6) negative air machines and corridor flanges at the firewall/barrier locations to the fourth floor (NW), to develop a Negative Pressure Enclosure (NPE) on the fourth floor NW. Negative air machines will draw from the outside of patient rooms, allowing for an airflow from halls past patients and into negative air machines. If returns will be left in the "on" position, HEPA filtration will be installed in this house system.

7. A minimum of negative 0.02 water column inches of pressure differential, relative to outside pressure shall be maintained within the NPE as evidenced by manometric measurements. This will provide a minimum of (X6) air exchanges per hour for the SIU. A continuous negative pressure will be maintained.

8. Prior to each shift the negative pressure enclosure system shall be inspected for breaches and smoke-tested for leaks and any leaks sealed, by the ASO.

9. The NPE shall be vented through HEPA equipments to outside buildings or:

    a. A smoke detection system, with automatic shutdown of all air movement equipment shall be installed with the air movement equipment, or a fire watch completed in compliance with NFPA 601 will be maintained[2].

10. In the event a positive pressure is recorded on required manometry equipment, the ASO/Safety Officer will notify the HICS Team and a remedial plan will be developed, approved by the HICS Team and implemented as required.

[2] NFPA: Standard #601, Security Services in Fire Loss Prevention, Quincy, MA; 2006.

11. The ASO for each shift will provide a fire watch in this area, in compliance with NFPA 601: Security Service in Fire Loss Prevention[2]. The ASO shall be qualified to enter the NPE (i.e. qualified to use a respirator) if required to do so to meet this requirement.

12. CAUTION and directional signs will be posted in and around the SIU to comply with OSHA and federal, state and local regulations. Alternate EXIT signs will be installed on NPE equipments to ensure EXIT signs are visible from all locations within the NPE. All signage will be inspected by the Safety Officer and approved prior to unit use.

13. The physical requirements of an Emergency Action Plan (i.e. fire extinguisher(s) located on-site and placed in the decontamination area) will be implemented. This includes a continuous means of communicating emergencies from anywhere in the SIU, including decontamination areas. Areas where poly and plastic are not Fire Resistant Poly (FRP) shall be considered a Class A hazardous area for the purpose of placement of fire extinguishers (minimum of [1] 4A extinguisher within 75' travel distance and 1,000 ft^2 of coverage per unit of A rating provided. Class C extinguishing agents shall be provided where electrical hazards exist). A fire extinguisher shall be located at each decontamination location. Poly may be located typically at decon locations.

14. DECONTAMINATION ENCLOSURE SYSTEMS: The decontamination area shall be developed adjacent to the SIU. This room shall be lined with plastic sheeting and sealed with tape, or other means will be used to allow for negative pressure development and ease in cleaning. A pre-made system is anticipated for this purpose[3]. Access between the SIU and decontaminated areas shall be through an airlock maintained under negative pressure.

15. The Decontamination Enclosure System shall consist of:

    a. An equipment area (with an airlock to the SIU) with storage for clothing and equipment. Negative air pressure shall be maintained[4] in this equipment room. Decontamination and sanitization supplies shall be maintained in this area.

[3] Mintie Technologies, Inc., 1114 San Fernando Road, Los Angeles, CA 90065.
[4] Occupational Safety and Health Administration: General Industry Safety Regulations, Sanitation, U.S. Department of Labor, Washington, D.C.

b. A clean room for street clothes, towels, clean or new respirators, and other sanitized items will be maintained outside the equipment area. A hand washing station will be located in this area.

c. All individuals working in the SIU will shower prior to leaving the hospital facility.

16. GENERAL ENTRY AND EXIT PROCEDURES (DECONTAMINATION):

a. Authorized personnel only shall enter the SIU through the decontamination enclosure system. Authorized personnel are identified by the Planning Section and approved by the HICS.

b. Prior to entry in to the SIU, all personnel shall sign an entry log.

c. Workers shall enter the SIU as follows:

Clean Room or Area:

1) Remove street clothing, and put on disposable clothing.

2) Secure respirator and don according to manufacturers specifications, including fit checks. Put on head covering and gloves/foot coverings.

3) Proceed through decon/equipment room to SIU.

17. EXIT PROCEDURES (DECONTAMINATION):

a. Proceed to decontamination area/equipment room.

b. Carefully remove all protective outer clothing and place in covered and labeled disposal/laundry container. Remove clothing inside/out, gloves first, then body covering. If launderable clothing will be used, place in sealed laundry bags.

c. Thoroughly clean the outside of the respirator face piece and exposed area of the face. Place towel in sealed container for waste disposal. Wash hands.

d. Enter clean room. Remove respirator in clean room before leaving the area, ensure that the respirator is properly cleaned; repaired if necessary, dried, and stored in a clean storage area for reuse. (Note: Additional or specialized decontamination procedures may be identified by the Safety Officer or Assistant Safety Officer [ASO]).

18. The Safety Officer or ASO will:

a. Inspect negative air machine filtration prior to final installation of the system.

b. Test the NPE at the completion of installation and prior to any activities to ensure a negative pressure is noted on manometry equipments.

Smoke testing and a physical inspection will be performed by the ASO prior to the initiation of each shift on both air movement equipments (filters) and enclosures. This will include the decontamination location.

c. Inspect respirator and PPE prior to use by all staff, to ensure it is stored, cleaned and used in compliance with manufacturers recommendations. The ASO will inspect and observe respirator use on each shift.

d. Ensure the site decontamination area is ready for use, and identify its operational readiness. The decon area will be inspected by the ASO prior to the start of each shift.

e. Provide a pre-shift safety briefing to all staff, including:
- Evacuation signals and means for patient evacuation.
- Respiratory protection and PPE decon processes.
- General safety hazards specific to the shift/area.
- Safety messages will be posted, as appropriate.

f. Material Safety Data Sheets for all hazardous substances used on the SIU will be maintained by the Safety Officer/ASO.

g. The ASO: Infection Control will meet daily with the Safety Officer and review site operations. The ASO: Infection Control is responsible for the maintenance of the Needlestick Log, in compliance with the OSHA Bloodborne Pathogen Standard[5].

[5] Occupational Safety and Health Administration: General Safety, Bloodborne Pathogens, 29CFR1910.1030, U.S. Department of Labor, Washington, D.C.

19. The Planning Section Chief/designee will brief all staff on shift Action Plans prior to the initiation of each shift.

C. Operations:

1. An ASO and a Logistics support person (within the facility), as well as a HICS Liaison (within the facility) will be assigned to each shift.

2. All personnel will enter the SIU through the decontamination corridor. All personnel will be fully protected for entry into the SIU once it is identified as operational.

3. Eating, drinking, smoking, chewing gum or tobacco are prohibited by staff in the SIU.

4. Personal Protective Equipment (PPE) for the negative pressure enclosure will be identified at the time of unit development. It may consist of:

   a. Full body covering (disposable or launderable).

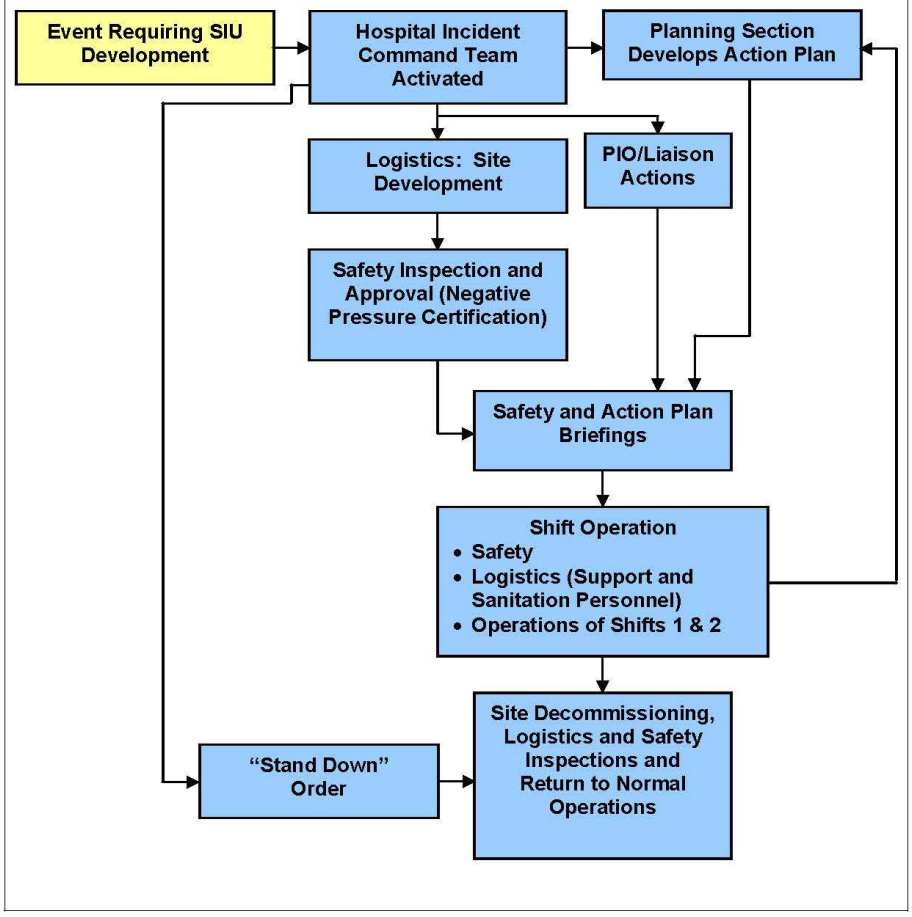
   b. HEPA filtered powered air purifying respirator or other approved respirator, used in compliance with the St. Luke's Respiratory Protection Program[6].

   c. Non-latex gloves.

The site development and operational flow chart for the St. Luke's SIU is found in Table II, below.

[6] Occupational Safety and Health Administration: General Industry Safety Regulations, Respiratory Protection, 29CFR1910.134, U.S. Department of Labor, Washington, D.C.

TABLE II
ST. LUKE'S SURGE ISOLATION UNIT (SIU)
SITE DEVELOPMENT/OPERATION FLOW CHART



V. RESPONSIBILITIES:

The responsibility for the operation of the SIU remains with St. Luke's.

Unmet needs are processed through the Lehigh County Emergency Management Agency. Technical assistance may be provided by the Pennsylvania Department of Health.

Liaisons from both organizations may be requested to participate as a member of the St. Luke's HICS Team.

VI. ADMINISTRATION AND LOGISTICS:

The St. Luke's SIU is under the administrative control of the Hospital Incident Command Team, as identified in this document.

Equipments for the development of the site are maintained by the hospital.

VII. TRAINING AND EXERCISES:

Training and exercising of this plan shall be accomplished in compliance with Table III, below.

TABLE III
ST. LUKE'S HOSPITAL & HEALTH NETWORK
SIU TRAINING AND EXERCISE SCHEDULE

PERSONNEL	TRAINING/EXERCISE COMPONENT
All Personnel Effected by this Plan	a. Initial plan briefing and PPE training, as required by OSHA. b. Re-education as components of the plan change. c. Annual exercise. d. Respiratory Protection Training[6], annually.
Safety Officer/Assistant Safety Officer	Respiratory Protection: Competent Person Training
Logistics Personnel	Preventative Maintenance and Equipment developed by the negative pressure ventilation equipment manufacturer. (Note: If Logistics personnel will enter the unit, Respiratory Protection training is required).
Hospital Incident Command and General Staff	ICS-100 and ICS-200H: Incident Command Training for Hospital Personnel

VIII. PLAN MAINTENANCE AND DISTRIBUTION:

This plan will be maintained by the Director of Hospital Safety and Security, who is responsible for any plan updates.

The plan will be maintained as a component of the Hospital Emergency Operations Plan.

IX. DEFINITION OF TERMS:

A. HEPA means High Efficiency Particulate Air filter, capable of eliminating 99.97% of particles of the size 0.3 microns or large with an aspect ratio of 3:1. All HEPA equipment used in the SIU shall be certified as such by a nationally recognized testing laboratory, such as the National Institute for Occupational Safety and Health (NIOSH) or the Safety Equipment Institute (SEI).

B. Negative Pressure Enclosure (NPE): A containment and exhaust system capable of maintaining a minimum pressure differential of minus 0.02 inches of water column relative to areas outside the enclosure. The system includes a device capable of measuring the differential, measured at the enclosure barrier to document efficiency of negative pressure air movement. The St. Luke's SIU Negative Pressure Enclosure is designed to provide a minimum of four air exchanges/hour with a 100% exhaust rate.

C. Hospital Incident Command System: The system used for the management of emergent events and incidents in healthcare facilities, compliant with the National Incident Management System (NIMS). The system identifies one individual assigned to manage an emergency (Incident Commander) with the assistance of Command staff (Liaison Officer; Safety Officer; Public Information Officer) and General staff (Operations; Logistics; Planning and Administration/Finance Sections).

   All emergency events are required to be managed with a NIMS compliant Incident Command System, such as the HICS, and municipal, state and federal responders utilize compliant systems which interface with the NIMS.

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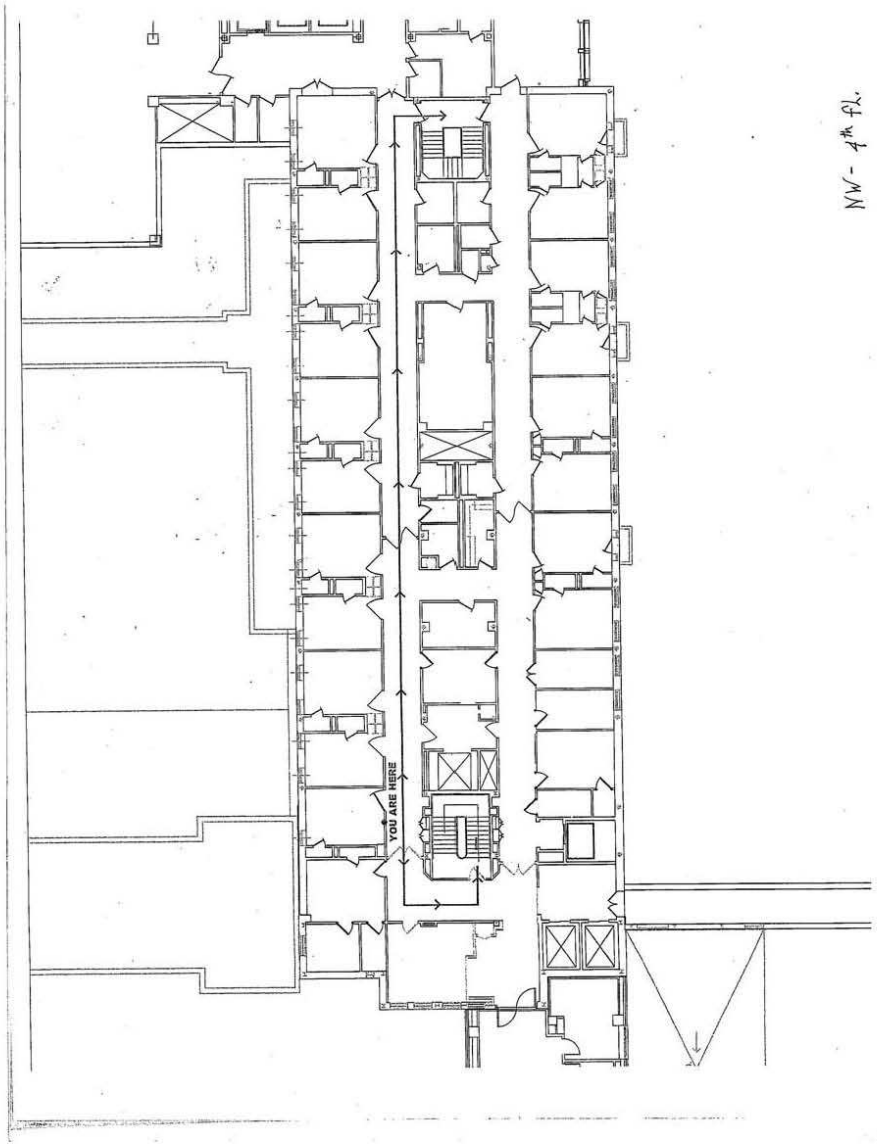
APPENDIX A

ST. LUKE'S HOSPITAL & HEALTH NETWORK
FOURTH FLOOR: NW
FLOOR DIAGRAM
NEGATIVE PRESSURE ENCLOSURE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NW - 4th fl.

APPENDIX B

OPERATIONAL CHECKLISTS

APPENDIX B-1

SITE DEVELOPMENT

ST. LUKE'S HOSPITAL & HEALTH NETWORK
SURGE ISOLATION UNIT (SIU): DEVELOPMENT CHECKLIST

ITEM NUMBER	ITEM	RESPONSIBLE PARTY	DATE/TIME ACCOMPLISHED
1.	HICS Team and EOC Activation	Incident Command	
2.	Position Assignments (HICS)	Incident Command	
3.	Initial Shift Action Plan Development	Planning Section	
4.	Initial Action Plan Approval	Incident Command	
5.	PADOH/Lehigh EMA Notification	Liaison Officer	
6.	PADOH/Lehigh PIO Contact	Public Information Officer	
7.	Initial Press Release	Public Information Officer	
8.	Initial Press Briefings	Public Information Officer/Incident Command	
9.	Assistant Safety Officers (Including Infection Control) Briefing	Safety Officer	
10.	Notification of 4 NW Occupants for Personal Item Removal	Liaison Officer	
11.	Movement of Medical Equipments to SIU	Logistics Section	
12.	SIU: Maintenance and PM Checks	Logistics Section	
13.	Negative Air Machine: Filter Checks	Safety Officer	
14.	SIU: Critical Barrier Installation	Logistics Section	
15.	SIU: Initial Cleaning/Sanitization	Logistics Section	
16.	Safety Emergency Equipment Signs Installation/Checks	Safety Officer	
17.	NPE Manometry/Smoke Testing	Safety Officer	
18.	Decontamination and Respirator Area Inspection	Logistics Section	
19.	Initial Staff Briefings (Medical Operations)	Planning Section/Operations Personnel	

Incident Commander _____ Date _____

APPENDIX B-2

SHIFT OPERATION

ST. LUKE'S HOSPITAL & HEALTH NETWORK
SURGE ISOLATION UNIT (SIU): SHIFT CHECKLIST

ITEM NUMBER	ITEM	RESPONSIBLE PARTY	DATE/TIME ACCOMPLISHED
1.	Shift Action Plan Development	Planning Section	
2.	Shift Action Plan Approval	Incident Command	
3.	Safety Equipments Inspection	Assistant Safety Officer	
4.	Negative Pressure Enclosure Inspection	Assistant Safety Officer	
5.	Preventative Maintenance	Logistics – Support Branch	
6.	Sanitization per Safety and Health Plan	Logistics – Service Branch	
7.	Pre-Shift Briefing	Planning Section	
8.	Respirator and Personal Protective Equipment Review	Assistant Safety Officer	
9.	Shift Documentation Maintenance	Administrative/Finance Section	
10.	Operations (Medical)	Operations Section	

Operations Section Chief _____ Date _____