



WEST VIRGINIA STATE
UNIVERSITY

An Evaluation of Shelter-in-Place Facilities

Analysis Conducted by the Kanawha Putnam
Emergency Planning Committee

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Shelter-in-Place Task Force

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Executive Summary

Providing a safe and secure learning environment is one of the primary functions of institutions of higher education. A key to creating that environment is the identification of rooms that can be used during emergencies. These shelter-in-place rooms can provide a safe refuge for students, faculty, staff, and visitors on the West Virginia State University campus. The administration of West Virginia State University, in conjunction with their faculty and staff, initiated this study to investigate the best locations for emergency sheltering.

The assessment conducted on the WVSU campus found that the majority of the rooms selected for shelter-in-place would be more than adequate. It is important to note that the rooms were evaluated not just for threats from the nearby Bayer CropScience but also for threats from weather events, human-caused activities and transportation accidents.

There are several general considerations that related to all of the identified rooms. The most challenging factor for utilizing shelter-in-place rooms is ensuring access to the rooms. Many of the rooms are locked and it was difficult to find a person to open the rooms; that would be unacceptable during an emergency. Something must be done to ensure that the rooms are open. Another consideration is that the rooms need to be completely closed and sealed to ensure the safety of the people inside the shelter.

In addition, it is recommended that the Erickson Alumni Center be used as the emergency command and control facility for the campus emergencies. That facility is secure and offers a much better location for command and control than the current designated location in the McNeil Facilities Building.

The final step in the successful use of the recommended rooms is training and education. All of the faculty, staff and students need to be provided the information necessary to make informed decisions regarding shelter-in-place. In addition, this information needs to be provided in multiple formats utilizing a range of communication methods (i.e. include on course syllabi, social media and YouTube videos).

We still have concern about special population access to all of the facilities. Many court rulings from around the country have found that separate but equal shelters are not legal. This suggests that all shelters need to be equally accessible to all people, including those with functional needs.

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The Kanawha Putnam Emergency Planning Committee (KPEPC) is the local emergency planning committee for both Kanawha and Putnam counties as defined by the Emergency Planning and Community Right-to-Know Act. The KPEPC works with emergency responders, chemical facilities, hospitals, the public and other stakeholders to develop emergency response plans. One of the community services provided by the KPEPC is shelter-in-place training and shelter-in-place room evaluation. The KPEPC completed this review by conducting room assessments, reviewing existing hazard studies of the area and meeting with plant and university officials.

I. Introduction

This paper provides a series of recommendations to enhance the safety of student, faculty/staff and visitors to the West Virginia State University (WVSU) campus. The intent of this paper is to provide an assessment on current and proposed rooms to be utilized for shelter-in-place.

The first part provides a snap-shot of the threats and hazards facing the WVSU campus. It is critical to take a holistic, all-hazard approach to look at chemical manufacturing, weather, human-caused and transportation incidents.

The second part of the assessment evaluated the current command and control capabilities of WVSU. This section discusses issues related to emergency notification, institutional communication and command/control.

The third portion provides the criteria for assessing shelter-in-place facilities. This includes information on how the specific rooms were evaluated such as the quality of windows and doors in the room. This section also includes an assessment of all the rooms considered.

Specific recommendations for enhancing all aspects of the WVSU shelter-in-place program are provided in the fourth section of this study.

II. Threats and Hazards

Over the last several years the threats and hazards facing local communities have changed from focusing strictly on chemical emergencies to an all-hazards approach. A variety of natural, accidental and human-caused threats impact college and university campuses. This paper approached the assessment of shelter-in-place by looking at all threats which have the potential to impact the safety of students, faculty/staff and visitors to the West Virginia State University campus. The following section provides a brief assessment of the threats facing WVSU Campus.

A. Chemical Manufacturing Facilities

The threats facing WVSU from fixed chemical facilities have been diminishing over the last decade. Traditionally, the biggest threat was from Methyl Isocyanate (MIC) which is an extremely hazardous material. In 1984, MIC was responsible for killing thousands of people in Bhopal, India. The production of MIC at the Bayer CropScience facility in Institute, WV was a major concern related to the safety of people on the WVSU campus and, in the surrounding areas.

Recently, the MIC production at this facility was decommissioned. This does not mean that the Bayer CropScience facility poses no risk for the WVSU campus. It just means that risks have changed and have been reduced. Extremely hazardous substances still on site at Bayer CropScience include: Ammonia, Aniline, Carbofuran, Hydrochloric Acid, Hydrogen Cyanide, Hydrogen Peroxide, Methomyl and Sulfuric Acid (based upon the SARA 311 report for 2012 submitted by Bayer CropScience).

At this writing, Bayer CropScience reports the following extremely hazardous substances are no longer being used in their manufacturing processes: Aldicarb, Carbofuran, Chlorine, Chloroform, Hydrogen Cyanide, Methyl Isocyanate and Phosgene.

Union Carbide Corporation, a subsidiary of the Dow Chemical Company, is a tenant of the Bayer CropScience facility and reports the following extremely hazardous substances are used in their manufacturing processes: Anhydrous Ammonia, Ethanediamine (1,2-), Ethylene Oxide, Hydrogen Peroxide, Nitric Acid, Propylene Oxide and Sulfuric Acid (wet cell batteries).

The Kanawha Valley is also home to a variety of other chemical facilities that have the potential to impact the WVSU campus. As was seen in the October 2, 2013 incident at the Clearon Corporation facility in South Charleston, even incidents in other areas of the county are cause for concern. However, safety practices and production safeguards have mitigated many of these concerns.

B. Weather Incidents

In 2012, areas around West Virginia were impacted by several large-scale weather events. The Derecho and Hurricane Sandy are two examples of large-scale storms that dramatically affected West Virginia by causing major power outages and fuel shortages. The impacts of climate change will likely continue to create concerns associated with extreme weather changes from blizzards and snow storms to high temperatures and droughts to heavy rains and flooding.

Obviously, weather incidents will most likely affect students, faculty and staff as they drive to and from the campus. However, severe snow storms or heavy rains have the potential to force WVSU to issue some sort of sheltering order. Officials need to be aware that there could be situations in which students, faculty, staff and visitors might need short-term sheltering if stranded on the WVSU campus.

C. Human-Caused Events

Nearly every week, human-caused events affect public safety in communities located across the country. Examples include acts of terrorism, active shooters and other intentional activities. By simply watching the news it is clear that shootings and other acts of violence are becoming more prevalent. It is difficult, if not impossible, to guarantee that nothing occurs on the campus of WVSU.

It is important to educate students, faculty, staff and visitors to remain vigilant. Part of that would be to promote the “See Something, Say Something” campaign. That campaign is a U.S. Department of Homeland Security outreach program that encourages all citizens to report things that look out of the ordinary. The goal is to prevent things from occurring by notifying emergency officials of the potential threat.

More information on “See Something, Say Something” program can be found at:
<http://www.dhs.gov/if-you-see-something-say-something%E2%84%A2-campaign>

D. Transportation Incidents

The WVSU campus is situated around a variety of transportation corridors including waterways, highways, railroads and pipelines. Each of these transportation modes are utilized to move hazardous materials through the Kanawha Valley thereby having the potential to impact students, faculty/staff and visitors at WVSU. Emergency planning and response agencies in the Kanawha Valley strive to maintain awareness of the materials that pose a risk to the public while in transit.

1. Waterway

The Kanawha River is a major transportation corridor for large amounts of commodities, both hazardous and non-hazardous, and is the primary navigable waterway in the study area. Industrial and commercial facilities located in the Kanawha Valley are the customers for these commodities. On average, about 11.3 percent of barge shipments on an annual basis are hazardous commodities. The vast majority of the rest of the shipments are coal.

All Commodities	Winfield Locks			
			CY2012	CY2006
			15,610,918	19,911,455
	Percent of			
	2012 All Commodities	CY2006		
10 - All Coal, Lignite, and Coal Coke	73.4	-29.3	11,458,439	14,810,600
20 - All Petroleum and Petroleum Products	6.7	14.7	1,042,131	888,550
30 - All Chemicals and Related Products	4.6	-28.6	716,750	921,450
40 - All Crude Materials, Inedible, Except Fuels	14.5	-35.4	2,263,000	3,063,900
50 - All Primary Manufactured Goods	0.3	-161.0	49,500	129,200
60 - All Food and Farm Products	0	0.0	0	0
70 - All Manufactured Equipment & Machine	0.5	-12.4	81,098	91,155
80 - All Waste Material	0	0.0	0	5,600
90 - All Unknown or Not Elsewhere Classified	0	0.0	0	1,000

In 2006, the Huntington District of the U.S. Army Corps of Engineers provided a list of the top commodities transported by barge through the Winfield Locks and Dam that are listed below. At this writing, these commodity lists were not available for the 2012 shipments that are almost 29 percent less than 2006.

- Acetic acid and salts
- Acetone
- Acyclic ketones w/o oxygen
- **Ammonia, anhydrous/aqueous**
- Calcium chloride
- Coal
- Cyclic hydrocarbons, NEC
- Esters of acetic acid
- Ethylene glycol
- Fuel oils, NEC
- Gasoline
- Iron ore and concentrates
- Isopropyl/propyl alcohol
- Limestone flux/calc stone
- Machine handling equipment
- Metal manufactures, NEC
- Methacrylic acid and salts
- Methanol (methyl alcohol)
- Natural sands (not silica)
- Oils and other products, NEC
- Other Acyclic alcohols, NEC
- Other ferro-alloys
- Other light oils
- Pebbles, gravel, crushed stone
- Portland/aluminous cement
- Propylene oxide
- Quicklime, slaked/hydrated lime
- Sodium chloride
- Sodium hydroxide, aqueous
- Specialized machinery
- Waterway improvement materials

*NOTE: U.S. EPA “Extremely Hazardous Substances” are denoted in red.

Many of these materials (with, possibly, the exception of coal), if spilled, would provide challenges to emergency responders. Large amounts of chemicals are shipped by barge to and from facilities in the Kanawha Valley. Spills of these chemicals may have environmental, citizen safety and emergency preparedness implications.

2. Highways

The Kanawha Valley is served by a complex system of highways. The highway systems includes three Interstates – I-64, I-77 and I-79 – along with U.S. Highways 35, 60 and 119 providing easy access to the Charleston Metro area. There are also many secondary roads linking the surrounding communities with Charleston. All of these roads are used to some extent in the transportation of hazardous materials.

The analysis of transportation information is based upon field studies during which information from truck placards was recorded. Data has been collected in 2008 (the most recent study). Three sites have been evaluated for this report to determine the amount of material moving past the WVSU campus. For each site, the total number of truck shipments per hour and the percent of trucks carrying hazardous materials was recorded.

Based upon the existing information, on average there are a little over 68 trucks passing the WVSU campus per hour (including I-64 and Route 25). Of those trucks approximately 10 percent--or more than six—are carrying hazardous materials near the campus every hour. These hazardous materials include formaldehyde and sulfur dioxide. The most common material transported was flammable gas or liquids, which can still present major challenges to the school campus.

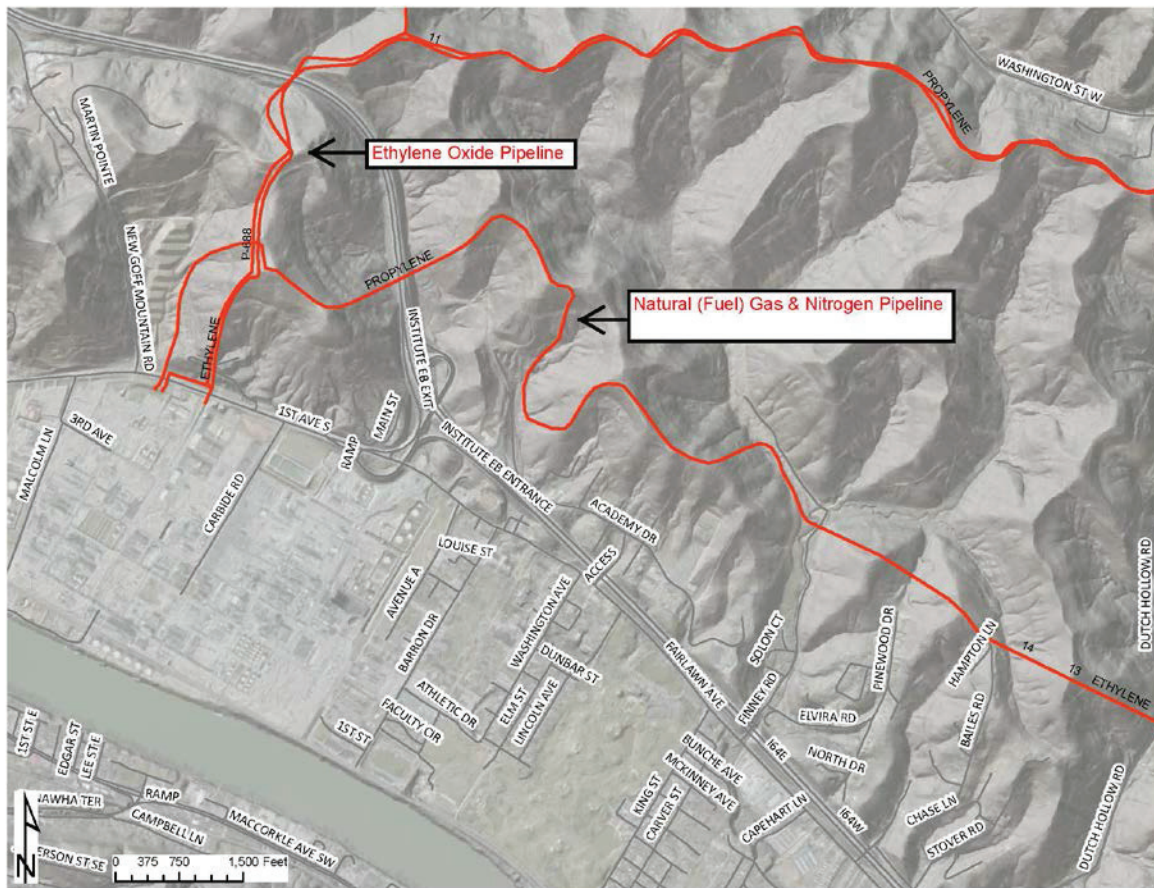
3. Railroad

Two (2) railways serve the businesses and industries of the Kanawha Valley. CSX Transportation has a major line on the south side of the Kanawha River, while Norfolk Southern runs on the north side. The main concern is the Norfolk Southern railway that runs adjacent to the campus. Information on materials transported was obtained directly from Norfolk Southern:

Top 25 All Commodities Shipped by Norfolk Southern (Nitro)		
Commodity	Hazard Class	Hazard Type
Ethylene Oxide	2.3	Poisonous Gas
Dimethylamine, anhydrous	2.1	Flammable Gas
Acetone cyanohydrin	6.1	Poisonous Materials
Methylamine, anhydrous	2.1	Flammable Gas
Dimethyl ether	2.1	Flammable Gas
Flammable liquids, n.o.s. (HMRC 4910185)	3	Flammable Liquids
Flammable liquids, n.o.s. (HMRC 4909328)	3	Flammable Liquids
Other regulated materials	9	Misc. Haz Mat/ORM
Dimethyl sulfate	6.1	Poisonous Materials
N, n-dimethylformamide	N/A	N/A
Ammonium nitrate	5.1	Oxidizers
Methyl methacrylate	3	Flammable Liquids
Disobutyl ketone	3	Flammable Liquids
Methyl isobutyl ketone	3	Flammable Liquids
Sulfuric acid	8	Corrosive Materials
Methyl isobutyl	3	Flammable Liquids
Trimethylamine, anhydrous	2.1	Flammable Gas
Dimethylamine, solution	3	Flammable Liquids
Methacrylic acid	8	Corrosive Materials
Chlorine	2.3	Poisonous Gas
Combustible liquid, n.o.s. (HMRC 4914155)	N/A	N/A
Hydrochloric acid	8	Corrosive Materials
4-thiapentanal	6.1	Poisonous Materials
Butanois	3	Flammable Liquids
Combustible liquid, n.o.s. (HMRC 4915390)	N/A	N/A

4. Pipelines

The threats facing WVSU from pipelines are low due to the fact the pipelines are approximately one mile away from the campus. These pipelines are used to transport ethylene oxide, natural (fuel) gas and nitrogen from the Bayer CropScience Institute facility to the Union Carbide Corporation facility in South Charleston. The aerial map below provides a view of the route of these three pipelines. A portion of the text on this map identifies pipeline labels incorrectly - “propylene oxide” is no longer transported to South Charleston via pipeline.



III. Communications and Command/Control

To effectively manage any type of incident on the campus of West Virginia State University it is critical to have adequate communications and an organized command and control structure.

A. Communications

Communications relates to the ability to provide timely, accurate information to students, faculty, staff and visitors during an emergency. The initial focus of communication relates to WVSU leadership and emergency personnel receiving the order to take a protective action (i.e. shelter-in-place or evacuate). Then, it is critical to get that information out to all students, faculty, staff and visitors on campus. Communications also plays a role in the command and control activities of WVSU personnel.

1. Emergency Notification

There is no single emergency notification system that works under all conditions. It is, therefore, recommended that WVSU utilize a variety of emergency notification methods. The school has numerous weather alert radios around campus. It is vital that those are properly plugged-in, programmed and monitored. Another tool frequently used is an automated calling system, but it only works when the numbers are correct. The school should develop a policy to update the numbers on an annual basis. It is also important that the numbers are direct dial numbers and not routed through switchboards. These updates should be provided to Metro 911.

County officials in the event of emergency will also likely use the emergency outdoor alert siren. The school should look into purchasing an indoor warning device called an “IP Informer” for critical personnel and to place them in critical locations. Those devices are controlled just like the sirens and deliver the same information, but are designed for the interior of buildings.

Social media is also becoming a source of emergency information. During a recent emergency Instagram, Twitter and Facebook were utilized effectively. In some cases it might be that WVSU officials, students, faculty and staff receive notification of shelter-in-place orders through social media. The school should develop protocols for verifying this information from other sources.

2. Institutional Communication

This relates to how the order to take a protective action is disseminated throughout the campus. At present, there is not an easy method to deliver critical emergency information throughout the campus. Parts of the campus have access to ShoreTel that can be utilized to deliver information. That system is not available in all areas. Only the dormitories have public address systems.

The lack of a single, campus-wide notification method is a concern. The ability to deliver a campus-wide message is critical to the timely setting up of emergency shelters. At present, there is no way to ensure that that message is being received at all of the shelter locations. When the campus moved the emergency outdoor siren away from the center of the campus that reduced the coverage.

There are systems available that can be placed in all of the buildings to provide notification, such as weather alert radios and IP Informers. There are also systems available that can utilize smart phone technologies. The administration of WVSU should investigate the installation of a campus-wide notification system. There is no single emergency notification system that works under all conditions and it is recommended that WVSU use a variety of methods to conduct emergency notification.

B. Command and Control Operations

Command and control relates to the ability of WVSU personnel to maintain situational awareness of both the incident and activities taking place on the campus. Having an effective command and control system in place will allow for a more effective response effort.

It is not clear how formal the current command and control process is at WVSU. We understand that it might vary by incident. But in many cases it would be recommended to have pre-identified personnel respond to an emergency operations center. These individuals could act as the interface between county emergency management personnel and campus response efforts.

One recommendation is to move the command center to the Erickson Alumni Center (2nd floor). It is expected that this would be the location that all command personnel would report to, if possible. The room could be outfitted with laptops, radios and telephones. It is critical that the room has Internet access.

A recommendation to utilize digital interoperable radio equipment would ensure communications between municipal, county, and state response agencies. The WV Statewide Interoperable Radio Network (SIRN) is a collaborative effort by state, county, and municipal public safety entities to establish and maintain a statewide interoperable radio network for emergency services.

There should be a policy to have the shelter representative from each of the shelter-in-place rooms to call into the WVSU command center to provide the names of all people in that shelter. This type of accountability is critical in formulating a response strategy. This could also allow for officials to know if there are any medical issues in the emergency shelters.

IV. Shelter-in-Place Room Evaluations

A. Considerations

Generally, shelter-in-place means simply staying indoors. Shelter-in-place involves using a structure or building to provide you protection from an incident. In the case of a chemical leak or a hazardous materials spill, it involves sealing a room to prevent exposure to harmful substances. The theory is that by being in a sealed room you will not breathe in the chemicals.

While the focus of this report is on shelter-in-place related to a chemical leak or spill, shelter-in-place orders can also be used during active shooter incidents and other types of campus emergencies.

1. Ordering a Shelter-in-Place

In most cases officials from WVSU would rely on Kanawha County Office of Emergency Management to order a shelter-in-place. Emergency officials would use a variety of methods to notify WVSU personnel to activate shelter-in-place plans. Traditionally, a shelter-in-place would be ordered if there were not enough time to get out of the area or when the evacuation routes would put people in danger of exposure.

2. Incident Duration

There is a balance between keeping harmful chemicals out of the shelter and preventing carbon dioxide from building up inside the shelter. Most shelter-in-place orders are for short durations but can last up to five hours. There is a tipping point at which the concentration inside the room starts to exceed the concentration of the chemical outside. In most cases a shelter-in-place order would last between two to four hours.

3. Room Considerations

When selecting a room for shelter-in-place it is important to evaluate a variety of considerations related to the construction of the room. It is critical that both the windows and doors can be closed and sealed. Another important factor is the ability to turn-off and shut all heating, ventilation and air conditioning (HVAC) units. For incidents of a longer duration it is important to have access to water and restrooms. It is also recommended that all of the rooms have fixed communication capability (i.e. hardline telephone). The most critical consideration is the ability to access the room at all times; a shelter-in-place room does no good if people cannot get in.

a) Windows and Doors

The windows and doors in the proposed shelter-in-place should be able to be closed and sealed. Many of the windows looked substantial and were not drafty. Any window that can be opened should have a tight seal when closed or be replaced with a fixed glass window.

Doors to the shelters should be inwardly opening and capable of being locked. Solid metal or wood doors work best. That would be beneficial in both active shooter and shelter-in-place incidents.

b) Heating, Ventilation and Air Conditioning Units

One of the considerations for selecting a room is the ability to turn-off and shut all heating, ventilation and air conditioning (HVAC) units. Some of the rooms have individual wall units and others are part of building-wide HVAC systems.

Rooms with wall units are not recommended as shelter locations unless the system can be completely closed off. For those rooms with wall units, it is important to look at dampers to determine the ability to seal it off from the outside.

Rooms that are in buildings with building-wide HVAC systems need to have a central control point that is accessible or have remote control switches.

In all shelter locations it is important to have supplies necessary to cover all ceiling vents.

c) Access to Restrooms and Water

It is also recommended that all shelters have access to restrooms and water. For short-term sheltering those considerations are not critical, but they can create a much more comfortable atmosphere in the shelter.

However, the lack of permanent restrooms was not a reason in and of itself not to recommend a room. In those cases it was suggested to WVSU officials to provide chemical toilets and bottled water as alternatives. If planning on using chemical toilets it is also recommended that you also purchase privacy screens.

The restrooms must be accessible for special needs populations.

B. Specific Room Evaluation

Campus Map No.	Shelter Location	Communication Box	Capacity	HVAC	Interior Door	Exterior Door	Windows	Special Needs Accessible	Shelter Recommendations
Q	ACEOP Building Upstairs Conference Room 305	No	25	Local	2	1	1	No	Seal attic access in closet
15	Canty House Second Floor	Yes		Local				No	Decommission shelter
16	Campbell Conference Ctr.	Yes		Local				No	Decommission shelter
21	Cole Complex Conference Room 112	No	54	Local/Remote	2	1		Yes	Consider reinstalling restroom in one of the closets
21	Cole Complex Room 210	No	60	Local/Remote	1			Yes	Replace crank style window (could not shut window)
21	Cole Complex Room 306	No	52	Local/Remote	2			Yes	Check seal on crank window, replace if needed
8	Davis Fine Arts 103	No	90	Remote	3		-	No	Chemical Toilet Would serve as primary shelter for building
8	Davis Fine Arts 305 Band Room	Yes	75	Local				No	Chemical Toilet Would serve as the overflow shelter for the building Move radio to Davis Fine Arts Room 103
22	Dawson Hall First Floor Lounge - 115	Yes	40	Local	3			Yes	Seal elevator doors, ceiling vent in restroom, need SIP supplies
22	Dawson Hall Second Floor Study Areas	No	40	Local?				Yes	Utilize study areas as shelters, use adjacent dorm room restrooms Recommend use for overflow usage
4	Drain Jordan Library 2nd Floor - Research Room	Yes	196	Local/Remote	4		4	Yes	Move switch to 2nd Floor Recommend moving communications unit to shelter location
14	Erickson Alumni Center Second Floor	No		Local-3 zones	1			No	Discontinue use as shelter Use 2nd floor as Command Center, move shelter to ROTC building Recommend purchasing a generator for building

Campus Map Building No.	Shelter Location	Communication Box	Capacity	HVAC	Interior Door	Exterior Door	Windows	Special Needs Accessible	Shelter Recommendations
1	Ferrell Hall Auditorium (1) and (2)**	Yes	202	Local/Remote	4			Yes	Restroom facility is not ADA compliant
19	Fleming Hall - Old Gym (1) and (2)	No	2,000	Local/Box on 2nd floor				No	Inspect all windows to ensure windows are sealed
19	Fleming Hall - New Gym	No	2,200	Local/remote				No	Ensure windows are sealed
3	Hamblin Hall Ground Floor G-001 (Auditorium)	Yes	102	Local	2	1	-	Yes	Consider: -Dampers in ceiling vents or materials to cover -Install differential pressure gauge to monitor inside / outside pressure -Chemical toilet in storage closet -Install handle rails in closet for special needs -Store ladder in storage closet for coverage ceiling vents (if necessary) -Consider utilizing 2 nd floor hallways and laboratories as overflow areas Permanently seal fireplace openings in 2 nd floor conference rooms. Find a way to ensure that all windows are sealed
23	Hill Hall Conference Room 219	Yes	27	Local/provide directions for Shutdown	2			No	
23	Hill Hall Conference Room 319 (overflow)	No	27	Local/provide directions for Shutdown				No	Permanently seal fireplace openings in 3 rd floor conference rooms. Find a way to ensure that all windows are sealed
24	Kanawha County Pre-School - First Floor **	Yes	91	Local	1	1	6	No	Shelter will not be used as a public shelter Remove SIP signage from building Moving internal shelter area to main day care area Inspect outside window seals
12	McNeil Facilities Building	No	TBD	Local	1	TBD	TBD	No	Decommission shelter Move command center to Erickson Alumni center
13	Ferguson-Lincoln (ROTC) Room 111	Yes	131	Local	1	1		Yes	Seal HVAC vents and duct seams in entry area Utilize restrooms

Campus Map Building No.	Shelter Location	Communication Box	Capacity	HVAC	Interior Door	Exterior Door	Windows	Special Needs Accessible	Shelter Recommendations
7	Sullivan Hall West Lounge	Yes		Local	2			Yes	Decommission shelter Utilize Wilson Student Union shelter
2	Wallace Hall Auditorium 122	Yes	210	Local/Remote	3	1	-	Yes	Chemical toilets
5	Wilson Student Union 134	Yes	259	Local/Remote	4		-	No	Chemical toilets
5	Wilson Student Union - Cafeteria	No	300	Local/Remote				Yes	Consider using to replace Sullivan Hall shelter Only use if vent hoods can be sealed
5	Wilson Student Union - McGee Suites (overflow)	No	55	Local/Remote				No	Consider using to replace Sullivan Hall shelter
37	Curtis Complex	No		Local				Limited	Not recommending for shelter Shelter in the Cole Center
30	Resident Housing	No		Local				Yes	Recommend that residents shelter-in-place in their homes Another option would be to shelter in closest shelter Set up as a normal home shelter
34	Bio-Plex	No	10	Local				Yes	Recommend shelter be set up in storage shed Will need a radio at location Cut plastic to cover AC unit on back wall, cover vents and door Add sign for shelter-in-place

V. Recommendations

The following sections provide some recommendations related to the proposed rooms evaluated. The first group of recommendations relate to some general considerations related to the shelter-in-place program at WVSU followed by some feedback on specific locations.

A. Recommendation 1 – Ensure Access to Shelter-in-place Room

During the site assessments many of the doors to the proposed shelter-in-place rooms were locked and it was difficult to gain access. WVSU personnel need to determine the best method to ensure access to the proposed rooms. This could be done by removing locks, have remotely control electronic locks, installing combination locks or by some other means.

B. Recommendation 2 – Inspect all Windows and Doors

Maintenance crews should inspect all windows and doors to ensure that seals are in good condition. In addition, all windows that can be opened should be inspected to ensure good operations and tight seal when closed; otherwise replace with a fixed glass window. If windows cannot be completely sealed in a safe manner the windows should be replaced.

C. Recommendation 3 – Update Placement of Shelter-in-Place Signs

Shelter-in-place signs should be removed from buildings that are not going to be used for public shelter-in-place rooms (i.e. Kanawha County Pre-School). Room numbers on existing signs need to be reviewed and updated as necessary. The placement of the signs on the exterior of the buildings should be reviewed and the signs should be moved as necessary to ensure the best visibility. It is also recommended that shelter-in-place signs be added to the interior of the buildings to provide directions to the designated rooms.

D. Recommendation 4 – Inspect all Shelter-in-Place Supply Boxes

Once all of the shelter-in-place rooms have been identified, the supply boxes need to be checked to ensure they are complete. Include in each box an updated supply list. Each of the boxes should contain pre-cut and labeled plastic for doors, windows and vents. The boxes should contain step-by-step directions for setting up the shelter. The tape in the boxes should be checked to determine if it is in good condition. There should be a schedule for checking the condition of all of the boxes (twice a year when the time changes). Once completed, the boxes should be taped shut. It is also recommended that you place small basic first aid kits in all of the boxes in case there are minor injuries. The maintenance plan should include protocols for reviewing the communication boxes, chemical toilets and other equipment/supplies.

E. Recommendation 5 – Procedures for Securing Shelter-in-Place Rooms

Protocols and procedures need to be developed to secure the shelter-in-place rooms once they have been set up. This would include providing signs to hang on all exterior doors and windows indicating that the room is sealed. There could be laminated signs in each of the boxes that state “Shelter-in-place in progress. Do not enter.”

F. Recommendation 6 – Conduct Shelter-in-Place Training

All students, staff and faculty should be trained in the proper way to shelter-in-place. Information should be provided through a variety of means: student manuals, employee handbooks, fliers in payroll checks, course syllabi, posters around campus, videos and a variety of other means. It is also recommended that the Shelter-in-Place Coordinators are provided with additional training and that they meet on an annual basis to review training materials and to discuss lessons-learned from exercises and real-life events.

G. Recommendation 7 – Publicize Policy and Procedures

Information related to shelter-in-place policies and procedures should be distributed through a variety of methods. What are the protocols if someone wants to leave a shelter? Can that person be restrained? Do you tell them up front, “We are closing this room, if you want to leave do so now.” This includes student manuals, course syllabi, handouts, posters, school webpage, seminar, faculty meetings and other methods. It is also recommend that the school adopt a policy requiring employees to follow all shelter-in-place policies and procedures.

H. Recommendation 8 – Utilize Media Program to Develop Videos

Utilize the talents and resources of students in the Media Studies program to develop shelter-in-place training videos. While some videos already exist, these could be specific videos showing a typical shelter-in-place supply box on the WVSU campus. In addition, the video could also address specific WVSU policies. These videos could be placed on the WVSU website.

I. Recommendation 9 – Develop Procedures for Special Needs Populations

Develop protocols to ensure that all shelters are available for persons with access and functional needs. Information should be developed that specifies which locations are suitable for shelter-in-place for special needs populations (specifically restroom facilities). Where possible, install hand rails and other devices to support individuals with special needs.

J. Recommendation 10 – Utilize a Variety of Emergency Notification Methods

WVSU should ensure that a variety of communication tools are used for disseminating and receiving emergency notification alerts during any emergency. This should include weather alert radios, IP Informers, text alert systems, social media and other tools available through Kanawha County Office of Emergency Management. The school should also ensure that updated contact information is regularly provided to Metro 911.

K. Recommendation 11 – Investigate Acquiring a Nixle Account

WVSU should investigate setting up a Nixle account for emergency notification. Nixle (nixle.com) is an email and texting service that can be utilized to deliver timely information to students, faculty, staff and other community members. The WVSU Police Department should be able to create a free account. Individuals can create a personal account (free to the individual users) to follow the school. Emergency information would then be texted to people with accounts. This could be used to alert people of on-going emergencies or to make other important notifications.

L. Recommendation 12 – Conduct Shelter-In-Place Drills

Shelter-in-place drills must be performed periodically during the school year. This exercise program should be built to include both basic training and hands-on practice setting up the shelters. A key participant in this training would need to be the shelter-in-place coordinators and their alternates. This training program would:

- Exercise your plan.
- Evaluate drill results against the plan.
- Identify gaps – what went wrong?
- Develop improvement plan to address gaps and update plan.

At least once per year, an exercise should be evaluated by persons who do not have a campus affiliation.

M. Recommendation 13 – Develop Overflow Plans

As part of the shelter selection process, overflow or back-up shelters should be identified. WVSU should build their overall shelter strategy taking into account large gatherings that might stretch normal day-to-day capacity levels. WVSU should develop protocols for identifying overflow shelter locations associated with each primary shelter.

N. Recommendation 14 – Formalize Policy to Shutdown HVAC Systems

The Administration of WVSU should develop a formal policy regarding procedures to shutdown all HVAC systems during shelter-in-place emergencies and drills. This should be incorporated into all training and operating manuals.

VI. Future Steps

This assessment is just the first step in a long process to ensure the safety of the students, faculty, staff and visitors on the campus of West Virginia State University. It is also critical that steps being taken to address the issues raised in this report are reassessed in the future and that appropriate corrective steps are taken. Preparedness is a never-ending process.

In addition to the steps outlined in this report, it is also recommended that West Virginia State University do the following:

1. Develop and implement a communication and emergency notification plan for the campus;
2. Complete an assessment of command and control needs and develop a plan to implement the findings;
3. Develop a multi-year exercise and training program including a plan to conduct HSEEP-compliant exercises on an annual basis; and
4. Conduct an assessment of campus threats and hazards on a regular basis and revise emergency plans and protocols to address identified gaps.

Appendix 1: Shelter-in-Place Room Observations

1. Wallace Hall Auditorium – Room 122

- a. Appears to be an adequate shelter
- b. No restroom facilities
- c. Requires sealing doors (taping)
- d. Shelter locks – keys? (All Shelter Locations issue)

2. Davis Fine Arts – Room 103

- a. Shelter was locked due to computer networking equipment inside. Staff says when this building is open a person at the reception area has keys to shelter. And if receptionist isn't there?
- b. This shelter has seats and computer desks in an auditorium style layout.
- c. Seal entrances and lower exit doors.
- d. No restrooms, but are located immediately next door.
- e. Seating for 80 people and room for an additional 10.
- f. Utilize Room 305 (Band Room) as shelter overflow area.

3. Ferrell Hall Auditorium

- a. Good location for shelter (large auditorium).
- b. Need to pre-cut plastic sheeting for overhead beam (crane) used on loading dock.
- c. No restrooms, but can utilize chemical toilets.

4. Wilson Student Union – Room 134

- a. Very large capacity shelter area.
- b. Has no restroom facilities, but has ample space for a temporary chemical toilet facility.
- c. Emergency / SIP Panel on wall.
- d. Consider using the cafeteria area as a shelter location in place of Sullivan Hall – West Lounge

5. Hamblin Hall Ground Floor Auditorium – Room G001

- a. Shelter is mostly below grade of ground.
- b. HVAC dampers close when off.
- c. If dampers don't keep air out consider installing closable damper in room vents.
- d. Consider installing a differential pressure gauge in shelter to measure outside / inside pressure.
- e. Consider utilizing 2nd floor hallways and laboratories as overflow areas.

6. Drain Jordan Library – 2nd Floor – Research Room

- a. Good location for shelter.
- b. Special Needs accessible.
- c. A few windows will require taping.
- d. Restrooms available.
- e. HVAC switch needs to be moved to 2nd floor.

7. Cole Complex Conference Room – Room 112

- a. Glass door exits to outside.
- b. Has two storage closets that were restrooms at one time. Consider re-commissioning one restroom.
- c. Has access to kitchen area with sink.

8. Cole Complex – Room 210

- a. Crank style casement window should be replaced or ensure window seal is adequate.
- b. Room has water but no toilet (toilet plumbing decommissioned).
- c. Has a separate room that could be used to locate chemical toilet.

9. Cole Complex – Room 306

- a. Crank style casement window should be replaced or ensure window seal is replaced. Notice light through the bottom of window while closed.
- b. No restroom facilities. Room is open with no partitions.

10. McNeil Facilities Building

- a. This building serves as Physical Facilities (maintenance) location plus serves as the Command and Central during emergency events at the University.
- b. This facility is one of the older buildings on campus and possesses multiple issues such as old casement windows and HVAC units mounted thru the walls.
- c. This building would require major improvements to serve as an effective shelter.
- d. Recommend moving the Command and Control operations to another facility during SIP event (i.e. Erickson Alumni Center).

11. Fleming Hall – Old Gym

- a. This facility has ample space for a shelter.
- b. Ensure windows in this facility are of the newer style (double pane) and sealed properly.

12. ACEOP Building – 2nd Floor Conference Room

- a. This facility has ample space for a shelter.
- b. Tape doors and seal attic access inside closet area.

13. Kanawha County Pre-School – 1st Floor

- a. Recommend moving the shelter area in the main day care area of building.
- b. Doors (4) and windows (6) would need to be sealed.
- c. Ensure windows are properly sealed on outside.
- d. Would have access to restrooms.
- e. Ensure water and snack food is available during sheltering.
- f. If this location is a private facility – remove the Shelter-In-Place signage from outside of building.
- g. HVAC controlled by wall thermostat.

14. Hill Hall – Conference Room 219

- a. The location of the existing shelter is the best choice if this building must have a shelter area. Also, utilize the Conference Room 319 on 3rd floor as an overflow shelter location.
- b. Fireplace chimney may need to be capped.
- c. Permanent seal fireplace openings in conference rooms on 2nd and 3rd floors.
- d. Precut and label plastic sheeting for windows, hvac units on walls and doors.
- e. Caution should be noted when taping the old style casement windows during cold weather. Tape may not stick to damp window frames. Tape plastic sheet over entire window area.
- f. Consider replacing windows in shelter locations.

15. Dawson Hall

1st Floor Lounge Area – 115

- a. Seal main entrance doors, evaluator doors and ceiling vent in restroom.
- b. Shelter box with supplies and instructions.
- c. Special needs accessible.
- d. Can building entrance doors be locked to prevent people from entering once shelter has been set up?

2nd Floor Study Area (North & South wing)

- a. Seal main 2nd floor entrance doors (may not be necessary) and elevator doors.
- b. Utilize restroom facilities in dorm room(s) at the study area and seal restroom vent.
- c. Special needs accessible.

16. ROTC

- a. Seal HVAC vent and duct seams.
- b. Seal all doors in shelter area.
- c. Provide chemical toilets or utilize facility restrooms by expanding shelter area.

17. Erickson Alumni Center – 2nd Floor

- a. Seal elevator and stairwell doors.
- b. Consider using this location as an Emergency Operations / Command Center during emergency events.
- c. First floor visitors or occupants would use the ROTC building as a shelter location.
- d. Consider purchasing computers and radios to be used to support command and control functions.

18. Sullivan Hall – West Lobby

- a. Decommission this shelter location and utilize the Wilson Student Union cafeteria area.
- b. During the October 29, 2013 team meeting, maintenance folks stated that utilizing the main cafeteria may be problematic due to vents above cooking stoves /grills. The vents are used to control fires on cooktops but don't have seals. Maintenance folks were going to check vents again.
- c. If the cafeteria area was usable as a shelter, McGee suites (adjacent to main cafeteria area) could be used as an overflow area. (very large room)
- d. Need to look at measures to ensure access through the cafeteria to Wilson Student Union.
- e. Consider using shelter in Room 134, which is on opposite side of Wilson Student Union if cafeteria is unusable.

19. Canty House

- a. Remove Shelter-In-Place signage from building.
- b. Decommission shelter.

20. Campbell Conference Center

- a. Remove Shelter-In-Place signage from building.
- b. Decommission shelter.

Appendix 2: Shelter-In-Place Task Force

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