After-Action Review of a Simulated Emergency Test Conducted by the PARA EmComm Team on October 7, 2023

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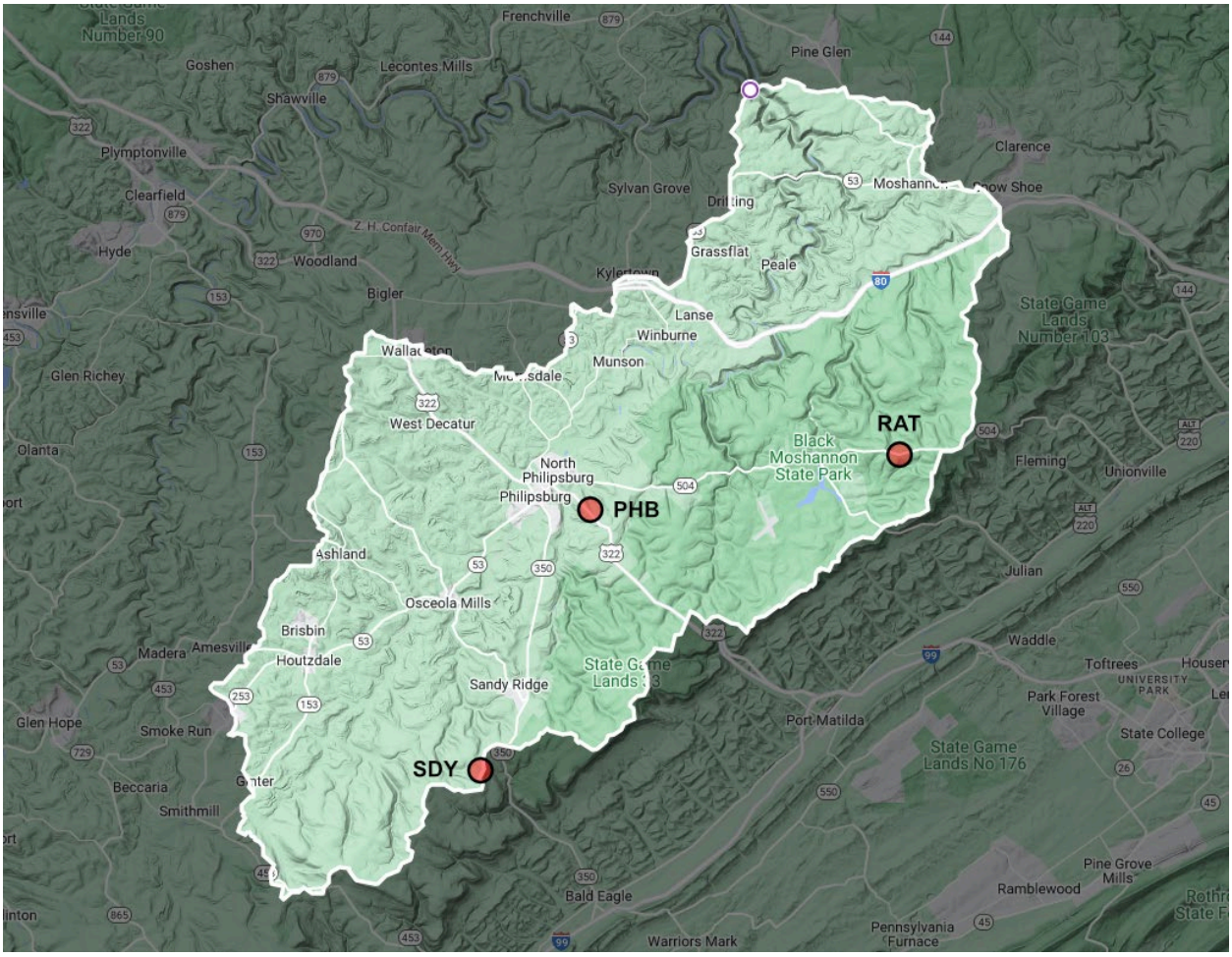

Map of the Moshannon Creek watershed showing PARA repeater locations

Objective

Our goal was to demonstrate and enhance our ability to effectively provide backup communications and related services to emergency management agencies and emergency services providers in Clearfield and Centre counties, with a particular focus on the Moshannon Valley:

- **Agency-to-Facility Message Relay** – Passing radio messages between agencies and facilities that cannot directly communicate with one another due to communication outages.
- **Agency-to-Person Message Relay** – Passing radio messages between agencies or facilities and individual people living in or near the Moshannon Valley who cannot be reached due to communication outages.

- **Field Observations** – Sending a skilled or semi-skilled observer to specific locations to observe and report conditions such as snow accumulation, stream water levels, dam seepage, flooding extent, traffic conditions, ionizing radiation levels, or other conditions of great interest to emergency management decision makers.
- **Shelter Communications and Radiological Monitoring** – Embedding a skilled radio operator in a public shelter to provide shelter-to-shelter and shelter-to-agency communications during a disaster while also providing radiological screening of guests arriving at the shelter who might have been exposed to ionizing radiation during a nuclear event.
- **Channel Monitoring** – Continual monitoring of radio transmissions on specified frequencies to provide emergency management decision makers with greater awareness of important events at the county, state, national, or international level.
- **Message Broadcasting** – Transmitting urgent public announcements issued by emergency management directors to the general population of the Moshannon Valley via our linked network of GMRS repeaters.

Served Agencies and Facilities

- Centre County EOC
- Clearfield County EOC
- American Red Cross at State College
- National Weather Service at State College
- Public Shelter at Philipsburg American Legion

Participants and Roles

• Chad McKissick	K3CLM	WRKY737	Base Station Operator
• John Horgas	KC3NCQ	WREQ699	Base Station Operator
• Johna McCormick	KC3SDS	WRWP792	Shelter Communications
• Regina Monaco	N2RNA		Shelter Radiological Monitoring
• Chris Deck	KC3POP		Field Observer
• Dave Crain		WRTZ383	Field Observer
• Ryan Williams	KC3SEB	WRWP791	Field Observer/Messenger
• Tim Leet	K5TEL	WRFM300	Relay Station
• Darren Dixon	W3DLD	WREE664	Relay Station
• Joe Petrulionis	KC3RHR	WRWG687	Relay Station
• Bob Snyder	KC3KVS	WRDT431	EmComm Coordinator

Test Protocol

- No cell phones
- No landline phones
- No internet
- No AC utility power

Test Schedule

- 0830 – 0900 Briefing
- 0900 – 1200 Testing
- 1200 – 1230 After-Action Review

Test Chronology

0905 Chad and John entered the EmComm Center and began monitoring.

0928 Received SET instructions via Winlink from K3CWP at Centre County notifying of a Coronal Mass Ejection affecting telephone and power networks.

1000 Received request from Clearfield EOC for Philipsburg Legion shelter to receive families from West Decatur who have no power. Total of 11 people.

1011 Received request via Winlink from REMOTE 3 (Darren Dixon) to check water level on Richard Street in Philipsburg near Rush Township building to confirm a report of water coming over the roadway. Dispatched MOBILE 3 (Ryan Williams) to the scene. He reported no water on roadway using a 5-watt handheld GMRS radio via the Philipsburg 575 GMRS repeater.

1033 Received weather report via Winlink from REMOTE 1 (Joe Petrulionis) who was operating on emergency power.

1042 Informed Clearfield EOC that the Philipsburg Legion shelter has received a total of 9 people from West Decatur. All were scanned for gamma radiation. Average radiation level was 0.03 uSv/hr. Two of the expected guests have not yet arrived.

1055 Received request for 18 blankets from Philipsburg public shelter. Forwarded request as ICS 213RR to State College Red Cross via Winlink email to arc-stcolege@winlink.org.

1055 Contacted REMOTE 2 (Dave Crain) to request stream level in South Philipsburg.

1101 Remote 2 reported stream level of Moshannon Creek rising at 1/2”-3/4” per hour, currently 3.04” from flood stage, flowing at 6.40 cu. ft. / min.

1115 Received a weather report via Winlink from REMOTE 3 (Darren Dixon).

1115 Dispatched MOBILE 3 (Ryan) as a messenger to the home of a DCNR Forest Manager to deliver a simulated request for him to report to an EOC to help manage a wildfire situation. There was no answer to the knock on the door. If the forest manager had answered the door, we could have relayed messages between the forest manager and the EOC in real time.

1128 Received ICS-213RR from Scott Mignot at Clearfield EOC requesting qty 12 oxygen machines from FEMA to be delivered to Penn Highlands Hospital at 809 Turnpike Ave, Clearfield, PA 16830.

1200 Test session was concluded.

After-Action Review

Backup Generator

We flipped the circuit breaker to simulate a loss of utility power at 0940. The radios and computers continued to operate normally on backup power supplied by the UPS, but the UPS was not happy with the power supplied by the Honda EU1000 900-watt generator. The error code displayed by the UPS indicated a wiring fault. We reversed the hot and neutral to no avail. We concluded that there was, in fact, no actual fault. Regina consulted the UPS manual and found that there is a way to disable the wiring test circuitry. This is something we will need to investigate and resolve.

UPS Capacity

The UPS supplied power for at least 30 minutes while we attempted to make it work with the generator. The graphical display showed 50% power remaining in the batteries, so it probably could have supplied power for more than one hour. The graphical display indicated a 25% load. The rated capacity is 1500 watts, so the estimated load was 400 watts. We were powering two computers, two monitors, an Astron 50A power supply and four radios.

We concluded that the one-hour backup capacity of the UPS would provide sufficient time for a team member to fetch a generator from their residence and bring it to the Legion in the event of a power outage.

Signal Quality from Clearfield EOC

We noticed that the audio coming from the Clearfield EOC as pretty good at times and pretty poor at others. John Szwarc N3SPW, who was working at the Clearfield EOC during the test, later said that they

were using two different radios and two different antennas. They suspected there might be a problem with one or both antennas. John asked Scott Mignot, EMA director, if they recently had a lightning strike on their tower. Scott said he was not aware of one. But John seems convinced that they have a problem on their end with one of the radios or antennas.

Handheld Radios Used in Close Proximity to the PARA EmComm Station

Some people had problems using GMRS handhelds on the Philipsburg 575 repeater from inside the Legion building. Suspect that transmitters were desensitizing receivers due to close proximity. Need to find a technical solution. Consider using Reverse feature if available, or adding a Reverse channel otherwise. (e.g. PHB575 and PHB575R)

Transmission of Digital VHF Signals Affecting Reception of Analog VHF Signals

We noticed significant digital hash on received audio from the Rattlesnake 43 when Chad was transmitting Winlink messages using the 2-meter antenna donated by Ed Hinkle that was located at the front of the attic. Chad and Bob discussed the possibility of mounting a 2-meter omni directly above the Yagi antenna cluster at the front of the building in order to reduce coupling between Yagis.

Availability of Amateur and GMRS Call Signs

We had intended to use tactical call signs exclusively. But on multiple occasions our operators needed to know the Amateur or GMRS call signs of PARA members or persons located at other facilities. This need arises when a radio operator does not respond to his or her tactical call sign. In the future Bob needs to provide this info. We also need to get better at capturing this info in real time during an activation as we correspond with individuals at other facilities.

Effectiveness of Shelter Radiological Screening

Radiation screening of numerous test volunteers failed to detect a package of weakly-radioactive Coleman lantern mantles concealed in one person's shirt pocket. We have asked Regina (PhD Biochemistry) to experiment with Radiacode 102 and GQ GMC500+ radiation detectors/dosimeters and consider developing training materials for PARA members and shelter staff to enable them to screen shelter guests for radiological contamination.

Time Slots for Remote Station Check-Ins

Chad suggested setting up time slots for people to periodically check in, e.g. once per hour. By scheduling these check-ins for different time clots, we might reduce sudden bursts of radio traffic. We will explore this for future exercises.

The Need for Headsets

With four separate radios monitoring four different channels, it was sometimes difficult to follow a single conversation. Chad suggested that headsets would might be very helpful. We discussed having the audio from one radio in each ear with a toggle switch to activate the left or right PTT and MIC circuits.

The muted audio channel could then be routed to an external speaker so other room occupants could hear it.

ICS and ARC Form Organization

Base station operators were provided with a stack of bins containing six standard ARC and ICS forms. Additional, empty bins were labeled ACTION REQUIRED and ACTION COMPLETED. Operators were instructed to place any forms that required further processing into the ACTION REQUIRED bin. The EmComm Coordinator monitored this bin and assigned requests to the appropriate personnel.

In some cases, the forms were missing important information, such as the quantity of an item that was requested or the time that a request was received. Multiple factors contributed to this, including the time pressure experienced when message volume is high, the presence of irrelevant fields on the forms, and a lack of experience with the forms.

Unfulfilled Request

We received a request from the Centre EOC to send a messenger to the home of the Morris/Cooper Township EMC. This request was heard, but was never recorded and was consequently not fulfilled. This indicates a need for better workflow management.

Legibility and Completeness

Some of the information written on ICS forms in haste was difficult to read. Some ICS forms were completed without date or time information. This indicates a need for additional familiarization and training on ICS forms.

Some ICS Forms May Need to be Adapted

Some ICS forms contained fields whose meanings were unclear or not relevant, resulting in unnecessary questions and wasted time. Bob will consider adapting the forms. Bob will also consider designing a custom data management solution tailored to the needs of the PARA EmComm Center and capable of inputting and outputting data in formats that are compatible with served agencies. By storing manually-entered data in a database, we could potentially improve workflow management and eliminate legibility issues.

Pre-Event Communication Issues

Bob experienced difficulty in reaching PARA members in the days preceding the SET. Questions about availability sent by voice mail and text messages were not always answered. SET plans and associated materials sent by email were not always received in a timely fashion. It appears that some email servers are rate-limited. One participant reported receiving several important emails on the day AFTER the SET took place. Some volunteers thought they might have mistaken SET-related emails for spam. These issues will need to be addressed on a person-by-person basis to reduce the prevalence of pre-event communication issues.

Future Directions

Outreach to Local Shelters

We would like to build relationships with the directors of public shelter facilities located in or near the Moshannon Valley. Our network of GMRS repeaters would empower all of the shelter directors to communicate directly with one another using handheld GMRS transceivers. Each shelter director would need only a GMRS licance ($35), a good-quality handheld radio ($50-$100), and some basic instruction provided by PARA EmComm team members.

Messenger Contact List

We would like to create a list of people who live in or near the Moshannon Valley and wish to be contacted by a PARA messenger in the event that they are needed by an emergency management agency that is unable to reach them by cell phone, landline, or email. This will enable us to prepare, for each contact, a hardcopy map and directions from the PARA EmComm Center to the person's residence. The printed map and directions will allow our messengers to quickly find people's residences at times when cell phone service and Google Maps are unavailable.

Winlink Email

Numerous people who participated in this SET or previous SETs have expressed a stong interest in using Winlink email for emergency communications whenever possible. Chad exchanged numerous Winlink email messages with volunteers acting on behalf of served agencies during the simulation. Winlink email saves time and eliminates transcription errors while automatically providing time-stamped records of every message sent or received.

John Szwarc N3SPW said that the amateur station at the Clearfield EOC has everything needed to use Winlink except for a computer monitor. He also said that the EMA director understands how much Winlink would help and that he supports adding Winlink capability at the Clearfield EOC.

We are told that the American Red Corss has a strong preference for Winlink email communications.

For these reasons, team member Chad McKissick is currently working to add Winlink RMS server capability to PARA's existing packet radio node located at our Rattlesnake repeater site. When completed, the RMS server will allow served agencies in Clearfield, Centre, and surrounding counties to exchange Winlink email messages with one another, even at times when the entire region is without internet service.

Conclusion

As EmComm Coordinator, it was personally gratifying to witness the level of enthusiasm and focus demonstrated by the participants. Based on the performance I witnessed during this SET, I am confident that, upon request, we could provide useful assistance to emergency management agencies and emergency services providers at both the county and municipal levels.

Bob Snyder
PARA EmComm Coordinator

For more information, please visit www.w3phb.org or send email to info@w3phb.org.