

2024 SET Success

New Jersey ARES is better equipped for surprise crises, thanks to this trial run.

Michael Prasad, KC2UOA

The Simulated Emergency Test (SET) on October 5, 2024, in New Jersey proved to be a successful collaboration between the American Red Cross and the Northern and Southern New Jersey Sections of the Amateur Radio Emergency Service® (ARES®). In addition to the national Memorandum of Understanding (MOU) between the American Red Cross and ARES, New Jersey has an MOU between the American Red Cross New Jersey Region and the ARRL New Jersey Sections for disaster planning and response.

SET in Motion

The 2024 New Jersey SET assumed a complete disruption of commercial communications within the state, including telephone, cellular, and internet services. This aligns with the Primary, Alternate, Contingency, Emergency (PACE) plan for communications systems continuity of operations, outlined by the Cybersecurity and Infrastructure Security Agency, as shown in Figure 1.

ARES volunteers simulated supporting two served agencies' shelter operators: the American Red Cross New Jersey and local New Jersey County government facilities. The simulation compressed 3 days of shelter emergency communications utilizing voice and digital amateur radio communications into approximately 3 hours. Voice communications were used for resource requests, announcements, and instructions. Digital communications via Winlink were used to transfer

formal written messages, agency forms, damage assessment reports, local weather observations, and welfare messages for evacuees. Digital communications were used because they are faster and more accurate than formal verbal message handling. One of the goals of the SET is to utilize the most common technical capabilities (requiring the lowest level of licensing) to cover the wide range of operators, radios at sites, etc., while attempting to cover gaps in radio propagation, interference, and other factors impacting emergency-based voice and data communications.

There were 74 ARES operators for Northern and Southern New Jersey, and seven American Red Cross hubs were simulated. Forty-eight local shelters and Emergency Operations Center (EOC) sites were also represented. The teams handled 283 formal written messages. There were 91 for the American Red Cross, and 192 were directed to or from the local shelters. There were also 245 tactical messages, including 99 for the American Red Cross and 146 directed to or from the local shelters and EOCs. Volunteers put in 194 hours for the American Red Cross and 225.5 hours for the local shelters and EOCs.

Voice and Data Communications Systems Continuity Objectives

The New Jersey region of the American Red Cross follows a pyramid of strategic, operational, and tactical objectives for emergency communications (EmComm), as shown in Figure 2. During incidents that impact

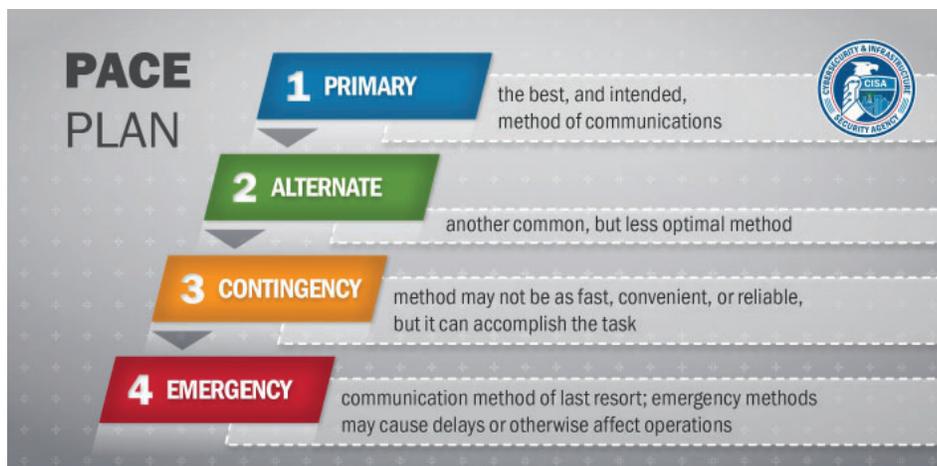


Figure 1 — PACE plan outlined by the Cybersecurity and Infrastructure Security Agency. [Image courtesy of the Cybersecurity and Infrastructure Security Agency]

Voice and Data Communications Systems Continuity

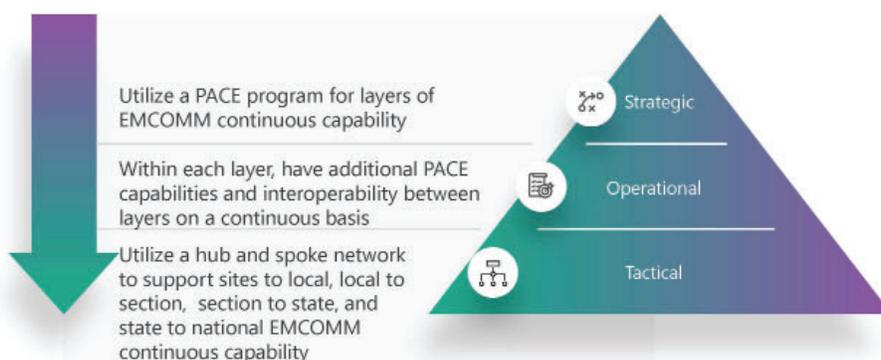


Figure 2 — The voice and data communications systems continuity objectives pyramid. [Michael Prasad, KC2UOA, image]

the entire state, the American Red Cross organizes in a geographic hub-and-spoke model, as shown in Figure 3, using its existing offices for communications and logistics support between locations. Each hub was interoperable between PACE layers, and we also ensured there were redundancies and backups within each layer. For example, a primary voice-based EmComm layer could have copper landlines, Voice over Internet Protocol telephony, commercial cellular, and government emergency telecommunications service/wireless priority service. We are exploring Winlink, VARA FM, UHF/VHF simplex/repeaters, HF (60-meter, VARA), EchoLink, and more for the amateur radio PACE layer in New Jersey. Many of these tools are interoperable between EmComm layers. For example, Winlink can be used where there is commercial internet service and can be connected to places that do not have connectivity.

Challenges

The SET event leaders organized some planned but unannounced changes to disrupt the exercise momentum, such as severe weather, blocked roadways, and evacuee surges to existing shelter sites. These changes were timed and scheduled. However, some challenges occurred that were unexpected by everyone.

First, a solo operator at a key communications site canceled at the last minute. This was realigned when the Information Technology Disaster Resource Center (ITDRC), a national volunteer nonprofit organization, was able to step in to support that location for radio communications. Remember to always have additional

resources staged to backfill or supplant locations when necessary.

Then there was real-time police activity near an American Red Cross communications hub that caused roadblocks and more than a 2-hour delay at the start of the exercise. Only time could fix this, and message traffic resumed as soon as possible. The solution is being worked out because the physical dispersal of communications hubs depends on the topography, locations, and power of repeaters as well as other technical factors.

As a state, we are continuing to explore different bands, HF (which will require different licensing levels), and other options to bolster the capabilities of critical infrastructure/key resource sites.

Final Notes and Key Takeaways

The 2024 New Jersey SET showed that emergency communications can cover the whole state when the Northern and Southern New Jersey ARES teams coordinate with disaster services technology volunteers from the American Red Cross New Jersey Region. Communications connections for voice and digital transmissions were successful, even when unexpected challenges occurred, like relocating radio operators at the last minute, shifting operations due to frequency interference, poor or degraded equipment performance, and sporadic regional repeater performance.

One of the hallmarks of amateur radio operations for emergency services is demonstrating ARES team flexibility and problem-solving, which was put to the test during this SET. This exercise was successful, and the organizers want to conduct interoperable state-

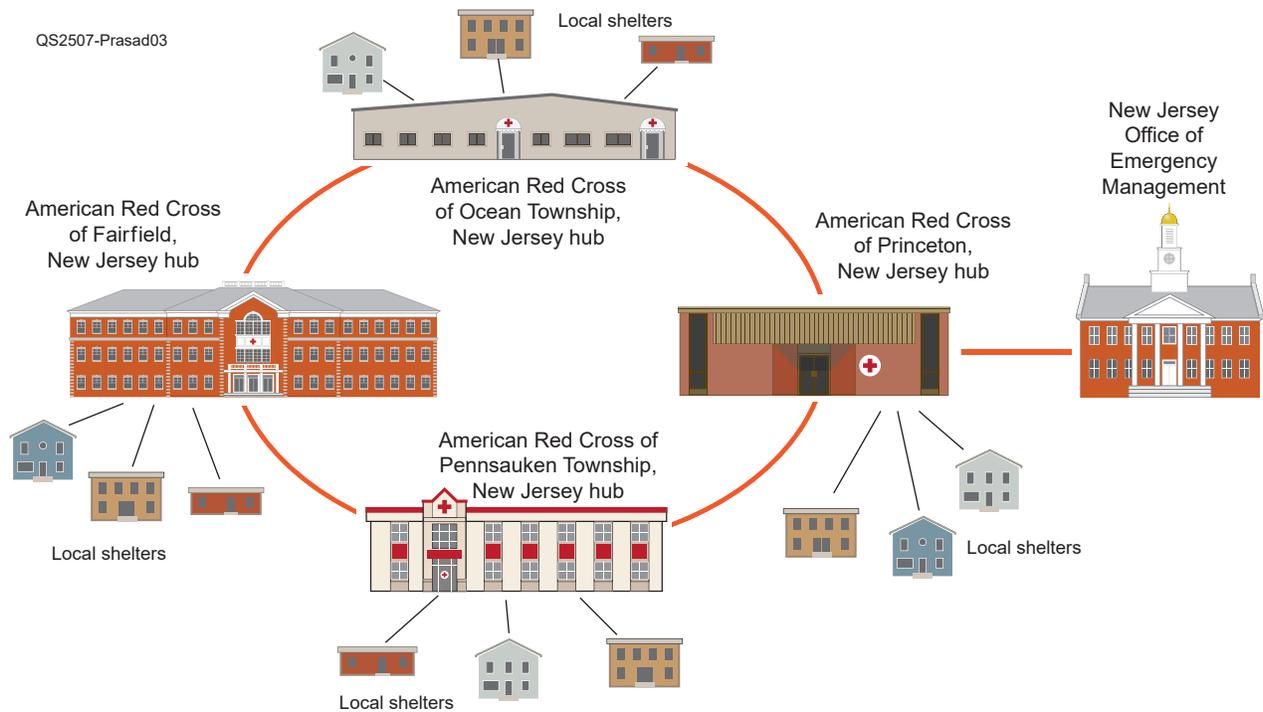


Figure 3 — A rough draft of the hub-and-spoke American Red Cross emergency communications plan diagram. American Red Cross hubs communicate with each other and other local shelters. The hub at Princeton also communicates with the New Jersey Office of Emergency Management.

wide SETs more frequently during 2025 by linking the SETs to the routine monthly nets conducted by the American Red Cross stations, ARES/Radio Amateur Civil Emergency Service, and even Military Auxiliary Radio System/SHARED RESOURCES groups. Many times, these nets are geographically regionalized, and the capabilities and consistent operation of relays, repeaters, and usable frequency bands always need an improvement process. Emergency communications will always involve problem-solving and remain flexible.

SETs provide an opportunity to expand partnerships and support beyond the American Red Cross and ARES teams. During this SET, ITDRC was added as an exercise player to support one of the simulated shelter sites in an area that did not have ARES coverage. ITDRC benefited from this SET by practicing deploying their mobile assets and staff, which included amateur radio. The SET benefited from having the ITDRC team as a viable force multiplier.

These exercises help assess the need to upgrade radio equipment and directional antennas based on further investigation of adding backup bands/frequencies and confirm Winlink capabilities within American Red Cross EOCs. Continuing to involve American Red Cross command and general staff from a National Inci-

dent Management System/Incident Command System perspective would benefit everyone because message traffic is meaningful and actionable during the exercise.

Finally, the SET established a working framework for future SETs to be expansive in coverage, possibly including state-operated shelter sites, fixed kitchen sites, points of distribution, and other mass care elements for large-scale incidents. The framework is also in place if the healthcare and hospital networks want to exercise their PACE communications capabilities to include amateur radio.

Special recognition to Northern New Jersey Section SET Coordinator Jim Breheny, N2JLF, and Southern New Jersey Section SET Coordinator Tom Devine, WB2ALJ, for their response work and preparations for this SET exercise.

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