

EXERCISE, EXERCISE, EXERCISE

Environment after the JULY 9, 2025, 7.8 magnitude New Madrid Earthquake centered on Memphis, TN

If a **magnitude 7.8 earthquake** were to strike **Memphis, TN**, the effects would be catastrophic across a wide region, due to both the strength of the quake and the soft, alluvial soils of the Mississippi Embayment that amplify shaking. Below is a detailed breakdown of **infrastructure damage and communication outages** likely to occur within concentric zones centered on Memphis.

Not included in this analysis and not required in this exercise is the farther-reaching impact of loss of communications capabilities and various products sent through a pipeline or cable/Microwave that travel through the stricken area. Anything that is specific to any given area that may surface while filling out the SitRep report may also be mentioned. Another example (of many) may be a nuclear electrical generating plant that would be required to shut down for an inspection for damage, and *if none found brought back up again (2-5 days)*. *Although there may be no sign of damage*, during that period, the plant produces no electrical power.

Below are concentric distance bands centered on the earthquake center, Memphis, TN.

Please determine your approximate distance from your location to Memphis and use the data below as a guide for filling out the Winlink SitRep report.

● 0–50 miles from the Memphis epicenter (Severe Damage Zone)

Includes: Memphis, West Memphis, Millington, Germantown, Collierville, Southaven (MS), and parts of NE Arkansas.

Infrastructure Damage:

- **Buildings:** Widespread collapse of unreinforced masonry structures, damage to even well-built structures. Hospitals, schools, and older downtown buildings may become unusable.
- **Bridges/Roads:** Major bridge failures (I-40, I-55 river crossings likely affected), road buckling, and collapsed overpasses.

- **Utilities:**
 - Water/sewer: Pipe ruptures; service loss for weeks.
 - Gas: Explosions, fires, and widespread leaks.
 - Electricity: Total blackout; substations and transformers damaged.
- **Hospitals and Emergency Services:** Overwhelmed or inoperable; potential for mass casualty incidents.

Communications Outages:

- **Cell Towers:** Many collapsed or offline due to power loss or backhaul failure.
- **Internet:** Local ISPs and fiber backbones likely severed.
- **Radio (including emergency and amateur):** Repeater towers may fail; mobile operations only.
- **Landlines:** Copper line infrastructure damaged; central offices may be inoperable.
- **Public Safety Comms (SHARES, FirstNet, etc.):** Severe degradation; SATCOM and HF systems may be primary backups. Winlink use where required.

● **51–150 miles from the Memphis epicenter (Moderate to Heavy Damage Zone)**

Includes: Jackson (TN), Tupelo (MS), Jonesboro (AR), Oxford (MS), Paducah (KY), Cape Girardeau (MO), and parts of Little Rock suburbs.

Infrastructure Damage:

- **Buildings:** Structural damage to older or poorly built homes; some partial collapses.
- **Bridges/Roads:** Cracking and minor collapses in older infrastructure.
- **Utilities:**
 - Partial power outages (days to a week).
 - Water disruptions: boil-water notices common.
- **Hospitals:** Functional but stressed from inflow of trauma patients.

Communications Outages:

- **Cell Towers:** Partial outages; overloaded networks.
- **Internet:** Regional fiber disruptions; latency and packet loss.
- **Landlines:** Some disruptions, especially in older systems.
- **Radio:** Some VHF/UHF repeaters out; HF more reliable. SHARES/amateur radio Winlink use where required.

● **151–300 miles from the Memphis epicenter (Light to Moderate Damage Zone)**

Includes: Nashville, Birmingham, St. Louis, Louisville, Chattanooga, and Springfield (MO).

Infrastructure Damage:

- **Buildings:** Minor cracking, fallen chimneys, broken windows.
- **Roads:** Minor cracking, rare overpass damage.
- **Utilities:** Mostly intact; short-term localized outages possible.
- **Hospitals:** Operational; potentially receiving patients transferred from impacted areas.

Communications Outages:

- **Cell Towers:** Operational but networks strained by volume.
- **Internet:** Mostly functional; some routing disruptions.
- **Public Safety Radio:** Mostly unaffected, except for relays tied to Memphis-based infrastructure. Amateur Radio/SHARES Winlink & SSB use where required.

 301–500 miles from the Memphis epicenter (Mild Damage, High Operational Strain Zone)

Includes: Atlanta (GA), Cincinnati (OH), Kansas City (MO/KS), Indianapolis (IN), New Orleans (LA), northern Florida, and parts of the Carolinas, West Virginia, and Texas.

Infrastructure Damage:

- **Buildings:** Minimal physical damage, though minor cracks and cosmetic issues possible in older structures on poor soils.
- **Roads:** Largely unaffected, with sporadic reports of surface cracking.
- **Utilities:** Power and water systems largely intact; may face minor disruptions from overloading or preventive shutdowns. Possible Nuclear Power Plants shut down for inspection (1-4 days)
- **Hospitals:** Not physically damaged but activated for mutual aid, trauma transfers, and surge staffing.

Communications Impact:

- **Cell Towers:** Functional, but bandwidth congestion from mass communication attempts to/from impact zone.
- **Internet:** Routing delays; priority services may get bandwidth precedence.
- **Public Safety Systems:** Operational but redirected traffic from Memphis-based regional dispatch centers may impact response time.
- **Radio:** SHARES/Winlink Use **with** increasing reliance for logistical coordination, EMCOMM, and data bridging to FEMA, CISA, other federal partners and NGO critical infrastructure partners.

501–800 miles from the Memphis epicenter (Minimal Damage, Strategic Support Zone)

Includes: Washington, D.C., Chicago, Houston, Dallas, Denver, Cleveland, Tampa, Orlando, and much of the Eastern Seaboard and Southern Plains.

Infrastructure Damage:

- **Buildings/Roads/Utilities:** No physical damage. Normal operations expected.
- **Hospitals:** Mobilizing regional EMAC (Emergency Management Assistance Compact) support teams and receiving high-acuity trauma transfers.

Communications Impact:

- **Cellular/Internet:** Fully operational; may experience routing inefficiencies due to backbone disruptions nearer epicenter.
- **National Coordination Platforms:** This zone forms the **primary staging base** for federal and interstate response, media briefings, logistics coordination, and HF/VHF/UHF EMCOMM relays.
- **Radio: SHARES/Winlink & voice use** becomes a **national coordination backbone**, with formal message traffic routed through relay stations and Region X/XI federal gateways.

Summary Table of Earthquake Impact Zones (Centered on Memphis, TN, for M7.8 Event):

Zone Radius	Primary Cities/Regions	Infrastructure Damage	Communications Impact
0–50 mi ()	Memphis, West Memphis, Germantown, etc.	Catastrophic	Severe loss; SATCOM/HF-only in many areas
51–150 mi ()	Jackson, Tupelo, Jonesboro, Paducah, etc.	Moderate to Heavy	Mixed outages; HF and SATCOM critical
151–300 mi ()	Nashville, Louisville, St. Louis, etc.	Light to Moderate	Some strain; mostly operational
301–500 mi ()	Atlanta, Cincinnati, New Orleans, KC, etc.	Mild	Congestion; key support role for relief coordination
501–800 mi ()	D.C., Chicago, Dallas, Tampa, Denver, etc.	Minimal	Strategic staging; relays and national comms hub

Other Considerations:

- **Liquefaction Risk:** High in Memphis and surrounding areas; soil instability leads to building tilts and utility rupture.
- **Aftershocks:** Likely numerous, further degrading communications and response efforts.
- **Transportation Disruption:** Mississippi River navigation halted due to collapsed bridges or port damage.
- Nuclear power plant shutdowns from 1-5 days in the 0-301 Mile range from epicenter (even for required inspection for damage) will cause far reaching power outages.
- **SHARES/Winlink/Voice HF Messaging:** Critical in 0–300 mile range; beyond that, likely to serve as a primary coordination tool with local, state national government, NGO partners and FEMA.
- **Amateur Radio/Winlink HF Situational Awareness reporting:** Beyond individual and coordinated health and welfare, amateur radio Winlink will be a critical element in reporting situational awareness “ground truth” to government emergency agencies where amateur operators are able to provide such information. This will assist all levels of emergency management with their resource delivery priorities. This would be true outside the obvious disaster zones since many services would be affected by the severe damage to Oil/gas pipelines, fiber lines for Internet services, and other such services that travel through the severely impacted areas for service delivery elsewhere. For those with Starlink and other survivable Internet, please use Telnet. This will alleviate expected congestion on the limited bandwidth amateur radio digital sub-bands used by Winlink scanning Radio Message Servers (RMS gateways).

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