

Inject Cards

The events described on these cards were developed to stress test FEMA's Strategic Foresight 2050 Futures Scenarios. Incorporating "injects" introduces an additional challenge of imagination in a foresight exercise, prompting participants to specify their roles and priorities in responding to a specific disaster, or convergent disasters, within the constraints and opportunities of a future scenario.

This document is one part of a set of divergent scenarios and does not represent a FEMA or U.S. government forecast of the future. This is a hypothetical environment for developing and testing strategic concepts.

Inject #1 – Situation Report

- A cascading failure occurred late last night in portions of the Texas, Eastern, and Western interconnects. Quebec Hydro and the Mexico's CENACE are also reporting instabilities in their grids. The Department of Energy has found the failure originated at the 5GW Tres Amigas SuperStation near Clovis, NM. By early morning, it became clear to authorities that over half a billion people are experiencing North America's first continent-wide blackout.
- In the preceding weeks, extreme winter cold had forced Texas's grid operators to institute rolling blackouts. Newly imposed Federal Energy Regulatory Commission (FERC) requirements to prioritize inter-regional transfers added to the challenge. Initial reports in the first few hours suggested that the situation may have triggered an instability that was not properly corrected by the artificial intelligence-led load balancing algorithms, leaving too much demand relative to the supply of wind-based renewables in the High Plains. It is still several hours until Southwest solar sources come online.



Inject #2 – Situation Report

- The Federal Aviation Administration (FAA) is responding to reports of abrupt system outages from multiple artificial intelligence-enabled air route traffic control centers (ARTCCs) in the Midwest including Cleveland, Memphis, and Indianapolis. The Cybersecurity and Infrastructure Security Agency's (CISA's) assessment is that the coordinated nature of the disruption in these three ARTCCs indicates a sophisticated cyberattack. In addition, UPS Worldport, FedEx World Hub, and Amazon Air Hub have reported that their systems are offline. There were no prior warnings, and no individual, organization, or nation state has claimed responsibility for the disruption.
- Given the possibility that the ARTCCs and cargo manifests have been compromised, FAA has issued a national ground stop except for military, police, and medical flights. Outbound international flights already enroute have been permitted to continue. All other planes in the air have been ordered to divert to the nearest airport. Despite rumors circulating on social media of airplane disasters, FAA and the airlines are reporting no such incidents. Regional governors have already instituted an Emergency Management Assistance Compact to provide trucks to keep commerce moving, but the president is facing increasing pressures to federalize National Guard units under the Defense Support to Civil Authorities process.



Inject #1 – After Action Report

- A dominant narrative that emerged in the wake of the blackout, and was reported extensively by media, is the differential impacts of the outage on urban and suburban communities. Northeast and Midwest metropolitan residents in multi-family housing were particularly hard hit unless they were on microgrids or had utility-scale battery backup. In contrast, suburban residents simply switched their houses over to their home batteries or autonomous electric vehicles to keep warm. With the outage only lasting a few hours, hospitals, water and sewer systems, and other components of critical infrastructure relied on their own backup sources.
- The New Mexico, Texas, and Federal governments each commissioned their own blue-ribbon panels to understand what went wrong and how it could be prevented in the future. Each reached a different conclusion, however. New Mexico placed blame squarely on Texas grid operators, and Texas in turn pointed to a lack of coordination between FERC and DHS's regional administrators to understand the risks. The Federal panel's assessment is forthcoming, adjudicating thorny liability issues. FEMA is collaborating with the Department of Energy and national labs to analyze the \$30 billion in projected economic losses and begin processing initial reimbursement claims.

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FEMA

Inject #2 – After Action Report

- The president decided after 48 hours to put FEMA in charge of sheltering and logistics response, but the damage had already been done. Although operations outside the region resumed within 72 hours, it took nearly two weeks to finally get displaced passengers home, and even a month later the chaos at the cargo hubs remains unresolved. The economic impact of business disruption and stock market losses was estimated to run into the hundreds of billions.
- Congress mandated a joint FAA and DHS Office of Inspectors General investigation. Through its efforts, CISA confirmed that the disruption was indeed caused by a cyberattack on a supply chain vulnerability in logistics software that in turn had corrupted AI training data. Despite the scale of the disruption, the FAA argued that safety protocols “worked flawlessly” to protect passengers and aircraft. The ensuing hearings, however, have been less sanguine, particularly considering evidence of systemic public and private failures across the industry with respect to cybersecurity. Furthermore, environmental activists are furious that FEMA can suddenly find the resources to shelter displaced carbon-burning travelers but hasn't done anything to address the needs of those that are displaced by ever-increasing floods, wildfires and other disasters.

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FEMA

Inject #3 – Situation Report

- The U.S. Coast Guard has just confirmed a series of power outages along the coast of Southern California resulting from concerted cyberattacks on the Ports of Los Angeles (LA) and Long Beach. Suspects are still at large, and the region is on lockdown until public order can be restored.
- With unloading operations disrupted and manifest databases corrupted, incoming ships have been instructed to remain at sea. Power outages have led to gridlock, and supply chain disruptions associated with rail and trucking have caused major backups on the 405 and 110 freeways. The LA County Sheriff's Department has issued a statement urging residents to avoid unnecessary travel until the situation has resolved.
- DHS is describing the cyberattacks as a "serious threat to national security," and has urged all ports across the country to review their cybersecurity protocols. However, fears of continued disruption have sparked a sharp response on Wall Street. The FEMA Region IX Administrator has coordinated support requests through mutual aid agreements, but other states have not responded due to reduced funding, vacant positions, and overworked personnel in the cyber security sector.

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FEMA

Inject #4 – Situation Report

- Today's high-level meetings at the Federal Reserve Bank of New York between EuropeRE, the world's largest reinsurer, and InsureMAX, the United States' largest insurer, ended in failure. As a part of the negotiations, EuropeRE is demanding several fundamental changes to the American insurance market to control rebuilding costs linked to rampant inflation and bring it into line with global standards.
- EuropeRE recently denied InsureMAX's claim stemming from the 2050 hurricane season because new catastrophe modeling showed significant exposure to correlated losses, in violation of their mutually agreed terms. Months of litigation are likely to ensue, and after the closing bell, the stock market is in major correction territory, with several other insurers announcing they are going to stop offering coverage for disasters linked to climate change if they are unable to hedge their risks.
- The White House has asked FEMA for an assessment of what perils are most likely to no longer be covered, where the greatest impact will be felt (both geographically and socioeconomically), and whether there is any alternative methods to the attribution science. States with large pooled risk programs are similarly demanding FEMA solve this problem.

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FEMA

Inject #3 – After Action Report

- Stable power and normal operations returned to the ports and broader region within days. The cyberattacks were attributed to a domestic terrorist group. Insufficient backup power and a lack of source redundancy hindered a speedier response and restoration effort. The ability for the attackers to circumvent cybersecurity measures at the ports and their associated grid assets caught many by surprise.
- The incident has underscored the need for increased investment in resilience and redundancy in critical infrastructure systems and for businesses to take proactive steps to protect their systems and network. The president issued an Executive Order for all federal agencies to update their cybersecurity protocols and increase cybersecurity staffing. In addition, CISA and FEMA were instructed to coordinate with sector specific agencies a set of response playbooks and develop a grant program to assist implementation for SLTT partners and with private industry. The cyberattacks also highlighted a lack of clear authorities in managing the recovery.
- Supply chain disruptions led to months of shortages. As fears around cybersecurity increase, analysts are reporting a further retrenchment in corporations relying on domestic manufacturing, even if it means that they do not have the latest technology.



Inject #4 – After Action Report

- In the end, the U.S. Government was unable to get EuropeRE to budge. Because it was considered too big to fail, the Federal Reserve was forced to offer InsureMAX a bail out that cost taxpayers over \$350 billion. Unwinding all the complex products took years. As lawyers and forensic accountants poured over the books, they found poor underwriting standards not based on the latest climate science and extensive collusion with regulators in coastal states. Numerous insurance commissioners have landed in jail and real estate transactions have been held up by mandatory disclosure laws informing buyers of past losses and future potential risks. Private insurers over the next year are rendered insolvent and a Blue Ribbon Panel is convened to investigate the impact to municipal finances as real estate valuations tumble.
- The U.S. Government has been forced to become the insurer of last resort. However, having ceded much of catastrophic risk modeling to the private sector, there is little consensus on what constitutes an authoritative pricing structure. In an attempt to reduce payouts and minimize exposure to correlated risks, regulators proposed reducing the long-standing reporting clause for aggregate damages from 168 hours to 72 hours. This causes additional chaos in the markets as no products available can address the steep rise in back-to-back storms that are no common in coastal areas.



Inject #5 – Situation Report

- Yesterday, the president announced a new initiative dubbed the “Migration Moonshot.” Modeled after the successful “Carbon Moonshot” initiative of 2030, this 10-year plan will incentivize migration out of Arizona, New Mexico, and other parts of the Southwest. Ever since last month’s devastating Ranch Fire caused billions of dollars of damage to buildings and roadways, policy analysts have suggested we might see such a program come out of the White House, despite concerns from northern states about the cost and further strain on their housing and infrastructure.
- Southwestern politicians, on the other hand, are livid. Phoenix Mayor Fahrmes told reporters “The American Southwest is strong. We have the technology to weather the heat and put out the fires, we just need the will. Washington is giving up on us.” University of New Mexico Professor Staid, who studies mass migration events, warned that such a policy will lead to a brain drain from the Southwest.
- Press Secretary Garcia acknowledged difficulties with the transition but stated “there is simply no choice. Taxpayers are on the hook anytime the Southwest sees a disaster, and we cannot afford to keep paying. We have to do something to protect the public and protect taxpayers and that means reducing our exposure in the region.”



Inject #6 – Situation Report

- At 1900 UTC on November 2nd, Cyclone Sagar made landfall north of Mumbai with sustained winds of 135 mph, a 16-foot storm surge, and flash flooding in low-lying informal settlements. Several key links, including the Trans-Harbour Link, Thane Railway Station, and the eastern end of Chhatrapati Shivaji Maharaj International Airport have been severed. The death toll is believed to be at least 100,000.
- With tensions in the region high and resources stretched thin by the recovery from May’s Cyclone Akash that made landfall near Kolkata, the Indian Prime Minister has accepted the U.S. President’s offer of assistance. FEMA has been asked to help advise on response and recovery efforts.
- Cyclone Akash displaced millions, of which 80,000 have made their way to the U.S.. These people are now in limbo. The revised UN Global Compact on Refugees conveys refugee status to those displaced by environmental disasters, but the U.S. is not following suit pending a Supreme Court ruling. FEMA is funding large, deeply unpopular, and crowded encampments that started initially at Travis AFB and Marine Corps Air Station Miramar but have grown to include available land seized by eminent domain in surrounding communities.



Inject #5 – After Action Report

- A year after its implementation and after over \$15 billion was spent on migration incentives, there is little evidence the initiative has had a significant impact. A series of investigative reports concluded many migrants were young, wealthy, and already mobile. The highest percentage population decrease happened in agricultural areas, as farmers already under stress changed careers and locations. This disrupted agricultural supply chains, raising food prices. Migrants interviewed said they found affordable housing in other urban areas and had no regrets about their move.
- Local emergency managers are concerned about their abilities to provide safe wildfire and heat emergency evacuation protocols for an increasingly vulnerable population.
- During increasingly common heat waves, utilities had developed expertise in managing demand and distribution, but their efforts have been outstripped by with more and more homes with heat-vulnerable individuals. Service providers have notified county officials that they may not be able to meet mandatory overnight cooling requirements for all residents with overnight lows often staying above 95 °F during summer months.

Inject #6 – After Action Report

- The Supreme Court, in a 5-4 decision, issued a narrow ruling that Temporary Protected Status could be extended to Indian citizens from West Bengal already in the country. This, however, implied that re-authorization would be necessary for any additional environmental disaster refugees resulting from Cyclone Sagar.
- As Congress refused to increase funding for the Department of Defense as well as Customs and Border Patrol, it fell on FEMA to continue funding the State of California shelter system. This also allowed FEMA to avoid its restriction on typically funding programs only for citizens, as the SLTTs in the region had relied on increasingly complex reimbursement schemes and broad interpretations of Storm Assistance for Immigrants and related programs.
- Immigration hawks are miffed that the world's challenges are being brought to the nation's doorstep. In their view, the broader geopolitical concerns of a stable, American-friendly subcontinent matter far less than sorting out domestic political tensions. There have been several legal challenges to not only reimbursement process, but also the government's takings, which have largely been upheld under a broad interpretation of the Religious Land Use and Institutionalized Persons Act.

Inject #7 – Situation Report

- In protest of the U.S. military's largest ever security assistance package to Taiwan, China has announced and put into effect a full blockade across the South China Sea. China's president justified it as a necessary response to U.S. interference in its internal affairs. The situation remains tense, and the U.S. is mobilizing significant military resources around the world in case a conflict erupts. The U.S. has stated that it will continue to support Taiwan's defense and has not ruled out the use of force to supply the arms the Taiwanese people have requested to defend the island.
- Taiwan's president is wary of the brinksmanship, and alongside other Pacific island nations released a statement seeking compromises to avoid an economic and humanitarian disaster or further escalation. In addition, global leaders have raised concerns about the fragility of supply chains amidst the blockade and broader geopolitical tensions. As a major producer of semiconductors and other high-tech components, Taiwan's hampered ability to conduct trade may lead to equipment shortages and price increases for a broad range of technologies. The American president has called upon DHS to prepare for potential disruptions and cyberattacks, including to critical infrastructure. FEMA is marshalling response and recovery assets especially near military installations.

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Inject #8 – Situation Report

- One week ago, a leak originating from Immigration and Customs Enforcement (ICE) of a U.S. Department of Agriculture report conclusively showed the link between various large-scale atmospheric seeding campaigns around the globe to cool the climate and persistent drought conditions in Central America. The ensuing drop in agricultural yields, which has only grown more severe over the past 14 years, have led to migrants leaving the region in droves and arriving at the U.S. southern border. In response, rumor has it that the White House is considering directing FEMA to ignore immigration status when providing cash assistance through the Individuals and Households Program. "After all," the president was quoted as saying in closed door briefing, "our carbon emissions are responsible for the desperate position these migrants find themselves in."
- The president has yet to confirm this statement, though her comments on the topic yesterday were briefly interrupted by someone yelling "The world's messes are not our problems!" Her polling numbers are down, and her communications director deflected questions about what this discovery means for the upcoming midterms. The DHS Secretary has been called by Congress to the Hill for testimony.

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Inject #7 – After Action Report

- After a tense few weeks of negotiations, diplomacy prevailed in breaking China's blockade. Working with regional partners and the E.U., the U.S. imposed strong sanctions on China despite some damage to its own economy. In exchange for its partners' support to impose those sanctions, the U.S. has strengthened its commitments to military assistance in the region.
- However, the strong U.S. response has also had its costs. DHS has been systematically reviewing all visa holders from China and Taiwan, and resulting rumor and outright malinformation has contributed to increased violence against Asian Americans. The mobilization of military resources tied up significant DoD resources, leaving some of FEMA's disaster response efforts short of its typical assets.
- Trade tensions between the U.S. and China are anticipated to continue for the foreseeable future, with FEMA typically getting outbid by the private sector in its attempts to replenish stockpiles. While the long-term effects of the blockade and resulting tensions remain to be seen, the White House is already facing tough questions regarding whether it squandered opportunities to avoid the blockade.

Inject #8 – After Action Report

- Though the president held meeting after meeting with global leaders and appealed to international law, most countries conducting geoengineering programs neither accepted responsibility for the crisis in Central America nor could be swayed to ramp up aid or disaster assistance. Looking weak in the face of a migrant surge to some, or inept in addressing continued human suffering to others, the president's party lost control of both the House and Senate.
- Congressional leadership wasted no time in passing legislation to tighten rules addressing undocumented immigration and criteria for asylum. A series of hearings subpoenaed evidence from the DHS Office of Inspector General showing that FEMA had not been sharing all information on sheltering migrants with ICE. The ensuing oversight and crackdown resulted in a significant increase in border apprehensions despite limited capacity to safely and humanely manage the influx and more intensive efforts to deport undocumented migrants. Human rights groups cited these tactics as contributing to 105 additional deaths during a recent heat wave in Albuquerque because undocumented immigrants were afraid to show up to cooling centers or seek medical assistance.

Inject #9 – Situation Report

- At 11am ET on October 3, the x-rays coming off a rare X20-class solar flare led to five hours with a complete loss of high frequency radio and sporadic outages of low frequency communication across the continental United States. Within the first few minutes of confusion, before backup air traffic control communications, VOR, and radar navigation systems could be brought online, a commercial pilot following her inaccurate GPS system flew a packed Boeing 797A from SFO into an oncoming flight from DCA whose pilot had turned off his erratic traffic collision avoidance system. Debris was scattered across several city blocks in Dayton, OH and first responders were delayed by their own radio challenges. Over 400 people in the airplanes, and 204 people on the ground died. Hundreds more remain in critical conditions. This pales in comparison to estimates of the toll from car accidents, delayed medical care, and other secondary impacts.
- Further air accidents were prevented by a stroke of good luck with good weather and high visibility from coast-to-coast. The president federalized the National Guard within the hour and deployed their hardened communications gear. Several critical nodes had their sensitive electronics completely fried, and FEMA has been tasked with a nationwide response and recovery effort that is anticipated to take several months.

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FEMA

Inject #10 – Situation Report

- A persistent heat dome over the Central U.S. is contributing to an unprecedented mass casualty event. Excessive heat warnings have been in place for Oklahoma, Texas, and Kansas for two weeks as residents battle with high temperatures above 110°F and heat indices above 120°F. Across this region, 3,000 heat-related fatalities have already been reported. Over 20 million residents have been without power for the past three days, and utility providers predict that it will be another week until power is restored to all communities. As hospitalization rates continue to increase and power outages persist, concerns are growing around continued ability to provide medical care.
- State and local leadership across Oklahoma, Texas, and Kansas are managing this with limited federal relief because extreme heat events are not often addressed by FEMA. The American Red Cross and local faith-based groups are providing support to communities to the extent possible, but the first responder communities are strained in their resources and staffing, and they are calling on external agencies to provide further support.

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FEMA

Inject #9 – After Action Report

- Thankfully, all other flights were able to land safely that day. The airlines and their insurers continue to battle in court over who bears the ultimate responsibility.
- While positioning, navigation, and timing (PNT) assets eventually recovered fully, demand for commercial travel remained weak for months. Free Carbon Movement activists – funded by the aerospace industry – claim that the administration and emergency managers were too focused on the effects of climate change that they forgot to plan for other outages and demanded an end to environmental elitism.
- A subsequent federal investigation into the cause of the disaster found a lack of investment in the FAA's core infrastructure. Furthermore, the consequences were made much worse because of a lack of SLTT contingency planning and training for PNT system outages. This report led the president to issue an executive order that FEMA must develop a new grant program to support SLTTs improve emergency response situational awareness and common operating pictures, which is estimated to cost several billion dollars. The administrator, however, suggests that this is less of a response or recovery mission than a public-private effort across infrastructure sectors helmed by CISA.

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FEMA

Inject #10 – After Action Report

- The Heat Response Plans for Oklahoma, Texas, and Kansas never anticipated the size and duration of power outages, and many residents suffered in the face of inadequate response resources, especially vulnerable populations who lacked access to alternative power sources and other protective measures. Hospitals operating near capacity were forced to only accept critically ill patients for a period of days. Still, community-based response efforts were impactful. Many neighbors conducted door-to-door checks, distributed water bottles and fans, and shared information via word-of-mouth.
- In contrast, the relationship between state and federal government personnel has become increasingly strained, with FEMA leadership seen as out-of-touch with the on-the-ground experience and Congress investigating why the agency cannot do more in a heat response. These tensions are cemented by an ever-growing sense of distrust between the U.S. population and the federal government.

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FEMA

Inject #11 – Situation Report

- A 7.4 magnitude earthquake along the New Madrid Seismic Zone has resulted in catastrophic damage and widespread injury and deaths across the Southeast and Midwest. With the epicenter being near Memphis, Tennessee has been hit particularly hard. The response effort is requiring fast coordination across multiple states and levels of government. Many residents across Arkansas, Tennessee, Alabama, Kentucky, Missouri, and southern Illinois are in crisis and initial response is focusing on search and rescue, bringing fires under control, providing emergency medical support, and reuniting families.
- These efforts are hampered by not having electricity or running water. Communication systems for responders are patchy at best and residents do not have ways to receive or send information. Many survivors with chronic illnesses do not have access to medicines or medical equipment, and the destruction of roadways, railways, and levees is preventing the delivery of these and other required supplies. Many buildings have collapsed, and tens of thousands of people are displaced. Concerns around potential aftershocks are high.



Inject #12 – Situation Report

- The National Weather Service is forecasting unprecedented flooding of the Missouri, Mississippi, and Arkansas Rivers in the coming days in response to thunderstorms expected to produce record spring rainfall. Officials announced that approximately 7.5 million people living in affected communities are under mandatory evacuation orders. State and local governments in Arkansas, Missouri, and Illinois are working to establish a common operational picture to ensure efforts are coordinated within and across state borders.
- While much of the region has used the Hazard Mitigation Grant program to develop flood walls and flood control projects, many citizens still live in flood plains. Residents in these areas have sprung into action to protect their homes before moving to designated shelters. A sense of panic has set in amongst many of the impacted communities. While most residents plan to evacuate, some have chosen to stay due to personal reasons or challenges. Local emergency managers are anticipating impacts in flooded locations, including power outages, closed roadways, lack of basic supplies such as drinking water, and the potential need to execute water rescues.



Inject #11 – After Action Report

- Although all impacted states had participated previously in catastrophic earthquake planning, the lack of public awareness resulted in limited preparedness across the region. Interviews with residents revealed that most schools and workplaces have not practiced safety drills and heavy items were not secured in their homes. Automated alerts were sent just seconds before intense shaking occurred, but individuals chose to wait for more information rather than take action. Although modern building codes proved effective at mitigating damage, many older buildings close to the epicenter either collapsed or experienced significant damage.
- Disaster recovery efforts revealed gaps in coordination among states, resulting in competition for resources and delays. Most homeowners did not have earthquake insurance and are relying on federal assistance for their recovery. The federal government is concerned about its ability to adequately fund the recovery and building back better. Congress is calling for improvements in the assessment and communication of natural hazard risks within state and local hazard mitigation plans and enhancing investments in seismic mitigation in anticipation of future events.



Inject #12 – After Action Report

- The scale of flooding proved to be consistent with forecasts, resulting in catastrophic damage even in flood-mitigated areas, a major response effort, and a prolonged recovery process. Disruption to transportation assets and other pieces of critical infrastructure persisted for several months after the event. Water drained slowly in some locations, resulting in additional flooding due to subsequent storms. The multi-state impact of this event also led to communication challenges across the many governments, agencies, and field liaisons involved, which hindered recovery efforts. These states are recommending the development of a unified plan for emergency flood operations that enables more integrated response to future disasters.
- The growth of the federal repetitive loss buyback programs by 60% since 2020 helped reduce the exposure of communities to flood waters, but gains were largely offset by increases in population and regional development. Insurable losses have totaled over \$40 billion across commercial and residential properties. For those whose homes were impacted by the floods, enhanced uptake of flood insurance across all population groups enabled many flood victims to start the recovery process sooner. Communities are using this rebuilding opportunity to improve the resilience of properties to future river flooding.

