

Position Paper: Protecting the Lifelines

Emanating from the Panel Discussion “Power,
Telecommunications, and Data Resilience Before and After
Disaster”

Jamaica Institution of Engineers (JIE) | University of Technology, Jamaica (UTech)
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Executive Summary

This position paper summarizes the discussions from the panel on safeguarding Jamaica's essential systems, power, telecommunications, and critical data, before and after disasters. The panel highlighted that these lifelines are interconnected: electricity supports telecommunications and data systems; telecommunications enable emergency response and public messaging; and data systems provide situational awareness, logistics, and ensure the continuity of government and business.

Drawing on panelists' perspectives across energy operations, telecom networks, digital infrastructure, emergency coordination, and engineering practice, the recommendations in this paper highlight five key priorities: hardening and redundancy for critical assets; continuity planning with realistic restoration benchmarks; governance and accountability for lifeline resilience; financing mechanisms that reward preparedness; and cross-sector interoperability in planning, drills, and incident response.

Purpose and Context

The panel discussion was convened to move beyond describing vulnerability and toward practical measures that reduce downtime and strengthen national continuity. The moderator framed the discussion around a single question: how does Jamaica ensure its critical lifeline systems can withstand disasters, recover quickly, and continue serving the public when needed most?

The session's goal was to identify exposure points, clarify what resilience means for power, telecommunications, and digital infrastructure, and agree on the partnerships and investments needed to shift Jamaica from reactive restoration to proactive continuity.

Panel Findings Structured by Moderator Questions

1. Vulnerability landscape: what is most exposed?

Panelists' responses focused on four vulnerability categories. The first is physical exposure of grid assets, towers, and critical network nodes to wind, flooding, and landslides, including access constraints that delay repairs. The second is operational fragility, especially limited redundancy for power supply to telecom sites and restricted fuel logistics for backup generation. The third is digital fragility, where single points of failure in data platforms, inadequate backups or replication, or weak cybersecurity hygiene can disable command functions when they are most needed. The fourth is governance exposure, where unclear restoration priorities, fragmented asset ownership, and inconsistent standards cause avoidable delays and confusion during crises.

Panelists indicated that hurricane-scale events tend to expose the same weak points repeatedly: distribution network vulnerability, tower power dependency, limited spare capacity, and the lack of pre-positioned resources and tested restoration playbooks.

2. Interdependence and cascading failures: what happens when one fails?

The panel highlighted that the three lifelines function as a system-of-systems. Power loss reduces telecom coverage as batteries drain and generators exhaust their fuel; degraded telecom coverage hampers emergency coordination and decreases the ability to deploy repair crews; and failure of data systems diminishes situational awareness and delays decision-making and logistics. Cascading failures were described as operationally significant: an outage at one critical power node can cut off service to multiple base stations, which then interrupts communication with water pumping sites, hospitals, shelters, and incident command posts.

To prevent the cascade effect, panelists recommended layered redundancy. They highlighted the need for minimum backup power durations at telecom sites, redundant routing for critical backhaul, and intentional prioritization of restoring assets that support multiple essential services.

3. Engineering for continuity: what practical measures strengthen lifelines?

Panelists' solutions emphasized practical hardening and redundancy measures. For power, they highlighted targeted grid reinforcement at critical nodes, sectionalizing and automation to isolate faults, and selective undergrounding or pole reinforcement in high-failure areas. They also stressed distributed resilience through microgrids for essential facilities and community hubs, supported by renewable energy and storage where possible. For telecommunications, they suggested hardening towers and shelters, improving physical security and flood protection at network rooms, and establishing redundant backhaul paths with diverse routes. For data and digital services, they pointed out resilient architectures, including replicated services across zones, offline or edge-capable incident systems, and tested failover procedures to ensure command and coordination functions remain active even when connectivity is limited.

Across sectors, panelists emphasized that resilience planning should be risk-based and rooted in hazard mapping and asset-criticality rankings, rather than in one-size-fits-all solutions.

4. Preparedness and recovery time: what determines hours versus weeks?

The panel viewed recovery time as a measurable indicator of resilience. Panelists identified the main factors affecting restoration time as access to damaged sites, availability of spare parts and specialized crews, fuel and logistics for backup power, and

the coordination systems that determine the order of restoration. They emphasized that contingency plans must be practiced and that pre-positioning critical spares, mobile towers, portable power, and inspection teams can greatly reduce restoration timelines.

Panelists suggested that Jamaica establish restoration benchmarks for essential services and publish them as national standards, with tiered goals for critical functions such as emergency communications, hospitals, shelters, water pumping, and key government services. They emphasized that benchmarks serve as management tools that promote investment and accountability.

5. Policy, investment, and accountability: how do we make resilience a national priority?

Panelists agreed that technical solutions will not scale without governance and financing reforms that make resilience a permanent requirement. They stressed the importance of clear ownership for lifeline resilience across the entire system, including a shared national framework for restoration priorities and interoperability among power utilities, telecom providers, emergency agencies, and critical service providers. They suggested formalizing public–private coordination for disasters so that data sharing, restoration sequencing, site access, and fuel logistics are established before a crisis.

Regarding financing, panelists advocated for investing in disaster preparedness beforehand rather than primarily spending after failures. They emphasized that resilience budgets should encompass both capital upgrades and maintenance routines that sustain resilience features over time. Additionally, they argued that regulatory mechanisms ought to reward verified resilience investments while promoting transparency and protecting consumers.

6. The next 12 – 24 months: what should Jamaica do first?

The panel’s practical action plan focused on completing a national lifeline asset criticality map and interdependency register, setting minimum backup power and redundancy standards for key telecom and data hubs, establishing a joint restoration and logistics protocol across lifeline operators and emergency agencies, and initiating targeted pilot upgrades in the most vulnerable corridors and facilities. Panelists also emphasized the importance of regular multi-agency drills that test communications, restoration coordination, and data continuity under realistic degraded conditions.

Recommendations for Post-Symposium Adoption

The panel’s recommendations can be organized into a comprehensive national program. Jamaica should establish a lifeline resilience framework that specifies minimum standards for continuity, restoration priorities, and inter-agency coordination rules for

power, telecommunications, and data systems. This framework should include clear restoration benchmarks and an annual public scorecard to ensure accountability.

Jamaica should invest in strengthening and adding redundancy at critical nodes where the largest cascades originate, focusing on assets that support hospitals, water pumping and treatment, emergency communications, shelters, and government command systems. The investments should include both physical hardening and operational resilience, such as inventory, logistics, and trained surge teams. Continuity planning and routine exercises should be mandatory for lifeline operators.

Plans should include tested failover for data systems, pre-negotiated mutual aid arrangements, and pre-positioned response assets, and they should be aligned with restoration benchmarks and reviewed periodically.

Financing mechanisms should be enhanced to support pre-disaster resilience. Regulatory approvals and investment recovery should be tied to verified resilience improvements, and funding for maintenance should be safeguarded to prevent resilience from declining over time.

Cyber resilience must be integrated into lifeline continuity planning, acknowledging that disasters can align with increased cyber risks and that secure communications and data integrity are vital for coordinated response and maintaining public trust.

Implementation Roadmap

In the first three months following the symposium, the recommended focus is on governance and standards. A joint lifeline resilience working group should be established, restoration priorities agreed upon, minimum backup power and redundancy requirements defined for essential nodes, and restoration benchmarks published for consultation.

Between months four and nine, the focus should shift to pilots and operational readiness. Targeted upgrades should be implemented for the most critical nodes, spares and mobile assets should be procured and pre-positioned, and at least one national simulation exercise should be conducted to test a prolonged outage scenario across power, telecommunications, and data systems. Between months ten and twenty-four, the focus should be on scaling and institutionalization. Node hardening and redundancy programs should expand, regular auditing and reporting should become routine, and funding and regulatory provisions should be institutionalized to support resilience investments and maintenance throughout the asset lifecycle.

Role of JIE and UTech

The Jamaica Institution of Engineers (JIE) and the University of Technology, Jamaica (UTech) are well placed to support the nation's resilience efforts by bringing together technical expertise, aiding standards development and professional training, and offering independent review capabilities for resilience designs and post-event assessments. Through targeted research and capacity building, UTech can assist in hazard-informed engineering design, asset criticality modeling, and data-driven evaluation of resilience measures, while JIE can enhance compliance culture and facilitate cross-sector coordination.

Conclusion

The panel's main message was that lifeline resilience is essential for national stability. Jamaica's ability to save lives and recover quickly from disasters depends on whether power, telecommunications, and data systems are designed, funded, coordinated, and tested as a unified resilience system. The recommendations in this paper provide a practical way to reduce downtime, prevent cascading failures, and improve national preparedness before the next major event.