Disaster Management Regulations for the Electronic Communications Sector in The Bahamas

Public Consultation Document

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UTILITIES REGULATION & COMPETITION AUTHORITY

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1. INTRODUCTION

The purpose of this Consultation Document is to propose regulations for disaster management in the Electronic Communications Sector (ECS) in The Bahamas.

In this Consultation Document, the Utilities Regulation and Competition Authority ("URCA") identifies Critical Electronic Communications Infrastructure (CECI) in the ECS in The Bahamas and proposes regulations to provide for the resilience and restorative ability of the CECI. Resilient and rapidly restorative CECI improves the probability that the CECI will be available to facilitate preparedness, recovery, and restoration before, during, and after a disaster emergency in The Bahamas.[1]

For the purposes of this consultation, CECI refers to carriage services, content services, electronic communications networks, and related facilities, supply chains, and information communications technology (ICT), which if destroyed, degraded or rendered inoperable for an extended period, would significantly impact the social and/or economic well-being of the nation, or affect The Bahamas' ability to provide national security[2].

In the context of this document, the terms emergency, disaster and disaster emergency shall have the following meaning:

> An unforeseen combination of circumstances which calls for immediate action, urgent assistance and or relief. This can be natural, technological, or man-made events that threaten serious damage to human life; human welfare; the environment; the economy; and or security within the Commonwealth of The Bahamas.

According to section 2 of the Disaster Preparedness and Response Act, a "disaster emergency" exists when the Prime Minister of The Bahamas declares by Order that an emergency exists.

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[1] Disaster Preparedness and Response - IFRC.org, http://www.ifrc.org/docs/IDRL/Montserrat%20-%20Disaster-Preparedness-and-Respons (accessed June 20, 2017).

[2] What's Critical About Critical Infrastructure? Retrieved from http://theconversation.com/whats-critical-about-critical-infrastructure-73849

The Prime Minister will make such a declaration upon receipt of the confirmation by the Director of the National Emergency Management Agency (NEMA) that a disaster has occurred. The types of disaster referred to in the Disaster Preparedness, and Response Act includes earthquakes, tsunamis, fires, floods, and tropical cyclones but does not preclude other types of disasters. Hence, in the context of these Proposed Regulations, the terms 'disaster' and 'disaster emergency 'shall be interpreted as set out above.

1.1 Background

The Communications Act, 2009 ("Comms Act" or "the Act") is the applicable law which governs the ECS, and further empowers URCA as the independent regulator of the sector. The Act charges URCA with the responsibility of implementing the ECS Policy (ECSP) and enforcing the provisions contained therein. Section 4 of the Comms Act affirms that electronic communications perform an essential role in promoting the economic and social welfare of The Bahamas and requires URCA to implement the Electronic Communications Policy objectives[3]. URCA considers that the regulations proposed in Section 5 of this Consultation Document should safeguard the economic and social welfare of The Bahamas and its people by promoting the availability, sustainability, and reliability of electronic communications systems and services, particularly in the aftermath of a disaster.

According to the United Nations (UN), Information and Communications Technology (ICT) is essential to a country's economic and social sustainability. The UN held that access to ICT is as vital as access to food, water, shelter, and sanitation, especially in times of disaster. This is because ICT systems enable disaster managers to forecast disasters in preparation for an impending disaster, disseminate information and warning messages, coordinate rescue and evacuation tasks, and coordinate recovery efforts.

[3] Part II-Electronic Communications Policy of Communications Act: Section 4 Objectives of the Electronic Communications Policy.

ICT networks and services must be resilient and, if compromised, rapidly recoverable to facilitate those critical disaster management processes. URCA believes that regulatory intervention can help to foster the network resilience and recoverability needed to enable the sustainability of the economic and social welfare of The Bahamas. Therefore, URCA in its 2016 Annual Plan committed to developing a multi-stakeholder initiative to promote the availability of the critical communications infrastructure which is needed in all phases of a national emergency or disaster to save lives, minimise property and infrastructural damage and reduce hardship in the aftermath of a disaster.[4] In fulfilment of this initiative, URCA issues this Consultation Document on its proposed Disaster Management Regulations for the Electronic Communications Sector ("the Regulations").

1.2 Objectives of this Consultation Document

In furtherance of section 11 of the Comms Act, URCA now solicits public and industry comments on this Consultation Document. This Consultation Document, therefore, has the following objectives:

i. to identify the critical electronic communications and ICT infrastructure;
ii. to set infrastructure goal and objectives;
iii. to set out URCA's draft Regulations for disaster management in the ECS; and
iv. to solicit responses from licensees, key stakeholders, the public, and other interested parties on URCA's preliminary views.

1.3 How to Respond to this Consultation Document

Respondents should submit written responses to this document to URCA by 5:00 p.m. on 19 May 2020. Persons may send their written responses or comments to URCA's Chief Executive Officer, either:

- By hand to URCA's office at Frederick House, Frederick Street, Nassau; or

[4] URCA Draft Annual Plan 2016 (2015). Retrieved from http://www.urcabahamas.bs/download/038195400.pdf.

- By mail to P.O. Box N-4860, Nassau, Bahamas;
- By fax to (242) 393-0153; or
- By email to info@urcabahamas.bs.

URCA reserves the right to make all responses available to the public by posting responses on its website at www.urcabahamas.bs. If a response is marked confidential, reasons should be given to facilitate URCA evaluating the request for confidentiality. URCA may publish or refrain from publishing any document or submission at its sole discretion. URCA will review the responses received on or before 19 May 2020 and issue a Statement of Results and Final Decision of the consultation simultaneously with the Regulations within 30 calendar days after the close of the public consultation period.

1.4 Structure of the Remainder of This Document

The remainder of this Consultation Document is structured as follows:

- Section 2 outlines the regulatory framework for this consultation process;
- Section 3 provides context for the proposed Regulations;
- Section 4 provides an assessment of requirement under section 5 of the Comms Act;
- Section 5 sets out proposed Regulations for disaster management; and
- Section 6 sets out Next Steps.

2 REGULATORY FRAMEWORK

In this section, URCA sets out the legal framework for issuing the proposed Regulations and the specific ECS Policy objectives that URCA is seeking to advance in relation thereto.

2.1 Communications Act, 2009

The Comms Act empowers URCA as the independent regulator for the ECS and governs the extent to which URCA may intervene in its activities. The Act also charges URCA with the responsibility of implementing the Electronic Communications Policy ("ECP") which sets out the objectives of the Government of the Bahamas.

Under section 4 of the Act, URCA has a statutory mandate to promote the economic and social welfare of the Bahamas and to further the interests of persons in the Bahamas by:

i. *promoting affordable access to high-quality networks and carriage services in all regions of The Bahamas;*
ii. *maintaining public safety and security;*
iii. *contributing to the protection of personal privacy;*
iv. *limiting public nuisance through electronic communications;*
v. *limiting any adverse impact of networks and carriage services on the environment; and*
vi. *promoting the availability of a wide range of content services which are of high quality."*

To ensure that URCA brings into effect the electronic communications policy objectives section 8(1) of the Act gives URCA the power to issues any regulatory and other measure and gives URCA the power to, inter alia:

"…

(c) impose conditions and penalties by order as specified in section 95 to 98;

(d) issue regulations

…"

When issuing regulatory or other measures section 11(1) (a) and (b) of the Comms Act requires URCA to provide persons with sufficient interest a reasonable opportunity to comment on proposed regulatory and other measures which URCA considers to be of public significance and those persons whose rights or interests may be materially adversely affected or prejudiced by the proposed regulatory and other measures. Section 11(1)(c) prescribes that due consideration must be given by URCA prior to the introduction of these measures.

Therefore, in accordance with section 11 and 13 of the Comms Act, URCA is providing interested persons with a reasonable opportunity to comment on the proposed Regulations.

2.2 Other Relevant Laws and Authorities

URCA recognizes the authority of the Ministry of Disaster Preparedness, Management and Reconstruction (MoDP) granted in September 2019 and the authority granted to the National Emergency Management Agency (NEMA) on 1 March 2006 under the Disaster Preparedness and Response Act. The Disaster Preparedness and Response Act establishes NEMA as the governmental agency with responsibility for disaster relief management especially as it relates to the mitigation of, preparedness for, response to and recovery from emergencies and disasters on a national level and charges NEMA with the responsibility to provide technical advice on draft regulations under any Act relating to the mitigation of, preparedness for, response to and recovery from emergencies and disasters in The Bahamas.[5] The Disaster Preparedness and Response Act also charges URCA, as a public body, to comply with the provisions of sections 11 and 13 of that Act.

[5] Disaster Preparedness and Response Act.
http://laws.bahamas.gov.bs/cms/images/LEGISLATION/PRINCIPAL/2006/2006-0004/DisasterPreparednessandResponseAct_1.pdf

URCA also recognises the authority granted to the Data Protection Commission (DPC) on 2 April 2007 under the Data Protection (Privacy of Personal Information) Act, which introduced basic rules to protect the privacy of individuals in relation to personal data and regulate the collection, processing, keeping, use and disclosure of certain information relating to individuals, which may could be utilized by other agencies while in the process of planning for mitigation, preparedness, response and recovery from emergencies and disasters[6]. Further, URCA is also aware that the Bahamas Department of Meteorology (Met Office) provides weather and climate information to the public and the international community, which is critical at all stages of weather-related disaster management.

Recognizing that the proposed Regulations will intersect with the areas of responsibility of other public agencies, URCA intends to consult with MoDP, NEMA, DPC, Met Office, licensees, key stakeholders, the public and other interested parties. This, in URCA's view, will ensure that the proposed Regulations will have the necessary input from relevant government ministries, agencies, departments, and interested parties, therefore, representing a balanced and well-considered approach to disaster management in the ECS.

[6] Data Protection (Privacy of Personal Information) Act. Data protection Commission. http://laws.bahamas.gov.bs/cms/images/LEGISLATION/PRINCIPAL/2003/2003-0003/DataProtectionPrivacyofPersonalInformationAct_1.pdf

3. CONTEXT FOR THE PROPOSED REGULATORY MEASURE

In this Section, URCA provides the context for the proposed Regulations by reviewing the international regulatory framework, explaining the phases of disaster management, presenting a gap analysis which serves to identify critical infrastructure and explaining the importance of a cohesive Business Continuity Plan (BCP) with components such as an ICT Disaster Recovery Plan and a Business Impact Analysis.

3.1 Review of International Regulatory Framework

In September 2019, Hurricane Dorian, a powerful Category 5 hurricane (the strongest storm to hit The Bahamas in a decade) struck the Bahama Islands of Abaco and Grand Bahama causing catastrophic destruction to the electronic communications infrastructure. In September 2017, two major category 5 hurricanes made landfall in the Caribbean. First, Irma, a Category 5 hurricane had struck the Caribbean Islands causing massive devastation to several islands including the British Virgin Islands, Barbuda, and St. Martin and impacting other islands such as The Bahamas and Turks and Caicos Islands significantly, although to a lesser degree. Also in September 2017, Maria, another Category 5 hurricane hit the Caribbean Islands causing immense devastation to Dominica and other islands that had been previously affected by Irma. Hurricanes Dorian, Irma and Maria affected communications, power, and water infrastructures severely and left many of the communities on the impacted islands without water, food, power, or communications.

The Intergovernmental Panel on Climate Change (IPCC) has warned that global warming would cause an increase in both the frequency and intensity of such disasters[7]. Due to its location

[7] NOAA. (2019). Global warming and hurricanes: An overview of current research results. Retrieved from https://www.gfdl.noaa.gov/global-warming-and-hurricanes/

in the hurricane belt, The Bahamas and the electronic communications infrastructure that sustains the economic and social ecosystem is at risk. Also, global warming is likely to increase the probability of the occurrence of other disasters, such as earthquakes, tsunamis, fires, and floods in The Bahamas. Studies have been conducted by international organizations such as the United Nations (UN) and International Telecommunications Union (ITU)[8] to show that the risks associated with electronic communications infrastructure can be substantially mitigated by the introduction of regulatory measures that facilitate, encourage and promote disaster management on a national level. Below, URCA reviews the international regulatory framework for disaster management before proposing sector-specific disaster management Regulations in the subsequent sections of this consultation document.

3.1.1 Tampere Convention

The International Telecommunications Union (ITU) published the Tampere Convention on Emergency Electronic Communications (Tampere Convention) on 7 January 2005 following its signing by 67 countries.[9] The Tampere Convention is a framework which addresses the use of ICT for disaster management and reduction of regulatory barriers that impede the use of ICT resources during disaster and disaster emergencies. Such regulatory barriers include (1) regulations restricting the use of electronic communications equipment or the radio-

[8] Tampere Convention (2005); Humanitarianism in the Network Age HINA Report; Sendai Framework For Disaster Risk Reduction 2015-2030; *2ND Global Forum On Emergency Telecommunications and* ITU-T Focus Group on Disaster Relief Systems, Network Resilience, and Recovery (ITU FG-DR&NRR)**.**

[9] The countries that signed the Tampere Convention include Argentina, Barbados, Benin, Brazil, Bulgaria, Burundi, Canada, Chad, Chile, Congo, Costa Rica, Cyprus, Czech Republic, Denmark, Dominica, El Salvador, Estonia, Finland, Gabon, Germany, Ghana, Guinea, Haiti, Honduras, Hungary, Iceland, India, Italy, Kenya, Kuwait, Lebanon, Lichtenstein, Lithuania, Madagascar, Mali, Malta, Marshall Islands, Mauritania, Mongolia, Morocco, Nepal, Netherlands, Nicaragua, Niger, Oman, Panama, Peru, Poland, Portugal, Romania, Russian Federation, Saint Lucia, Saint Vincent and the Grenadines, Senegal, Slovakia, Sri Lanka, Sudan, Sweden, Switzerland, Tajikistan, The Former Yugoslav, Republic of Macedonia, Tonga, Uganda, United Kingdom of Great Britain, and Northern Ireland,

frequency spectrum, (2) regulations restricting the transit of electronic communications resources into, out of and through member countries, which include The Bahamas, and (3) delays in the administration of such regulations.[10] URCA considers that alignment with the Tampere Convention would serve to avail the people of The Bahamas with critical electronic communications infrastructure and systems needed to improve disaster relief efforts during times of national emergencies and natural disasters. However, alignment with the Tampere Convention would require that URCA consider revising certain existing regulatory and other measures, albeit within the confines of the Comms Act, to permit:

i. Exemption of electronic communications resources for use in disaster mitigation and relief, in compliance with those regulations; and
ii. Expediting the processing of electronic communications applications for use in disaster and disaster emergencies, in accordance with existing regulations. [11]

Question 1: Do you agree that URCA should aim to remove regulatory barriers during a disaster emergency?

3.1.2 Humanitarianism in the Network Age Report

As previously stated, the importance of Information Communications Technologies (ICT) was recognized by the United Nations (UN) as an essential need in the Humanitarianism in the Network Age Report (the HINA Report). In the HINA Report, the UN stated that access to ICTs is as vital as access to food, water, shelter, and sanitation in times of disaster emergencies.

Subsequent to publishing the HINA Report, the ITU launched an ICT for disaster management initiative which had as a primary outcome the Smart Sustainable Development Model (SSDM).

[10] Regulatory Aspects of ICT in Disaster Mitigation, https://www.itu.int/en/ITU-D/Emergency-Telecommunications/Documents/Guatemala_20 (accessed June 20, 2017).

[11] 9824645E, https://treaties.un.org/doc/source/RecentTexts/25-4eng.htm (accessed June 20, 2017).

The SSDM recommends that the integrated actions of regulators and infrastructure owners should aim to create a connection between the government's disaster response plan and utilization of ICT. [12] In particular, the report indicates that:

i. Governments and Sector Regulators could minimize damage due to disaster by creating an agile licensing regime which could be executed during times of emergency;
ii. operators ensure resilience and recoverability by establishing a funding mechanism for infrastructure development and disaster management, which facilitate partnerships between the government, the private sector, and civil society; and
iii. Infrastructure enables ICT for disaster management.

As noted in the SSDM, URCA believes that in times of disaster, public-private partnerships could ensure:

- the availability of the communications infrastructure;
- the relaxation of communication congestion;
- early recovery of communication; and
- the use of satellite communications systems.

Question 2: Do you agree that public-private partnerships could ensure the availability of the communications infrastructure, the relaxation of communication congestion, early recovery of communication, and the use of satellite communications systems in times of disaster?

3.1.3 Sendai Framework For Disaster Risk Reduction 2015-2030

[12] Mic's International Cooperation in the Field of ICT For ... (n.d.). Retrieved from https://www.itu.int/en/ITU-D/Regional-Presence/AsiaPacific/Documents/Events/2016/May-RDF2016/Presentation/Kazuhiro%20Wada%20%28ITU%20ASP-RDF_r1%29MIC%e2%80%99s%

A more recent development in the international framework of disaster management is the Sendai Framework for Disaster Risk Reduction 2015-2030 (Sendai Framework). The Sendai Framework is a 15-year voluntary, non-binding agreement that aims for the substantial reduction of disaster risk and losses for economic and social assets of persons, businesses, communities, and countries[13]. The Sendai Framework conveyed that the State had the primary role in reducing disaster risk and asserted that responsibility for disaster risk reduction should be shared by multiple stakeholders including local government, the private sector, and other stakeholders. The Sendai Framework identified seven global targets for disaster risk reduction policy:

i. substantially reduce global disaster mortality;
ii. significantly reduce the number of affected people globally;
iii. reduce direct disaster economic loss that adversely impacts the global gross domestic product (GDP);
iv. significantly reduce disaster damage to critical infrastructure and disruption of basic services, among them health and educational facilities;
v. substantially increase the number of countries with national and local disaster risk reduction strategies;
vi. considerably enhance international cooperation in developing countries through adequate and sustainable support to complement their governmental actions for implementation of Sendai Framework; and
vii. significantly increase the availability of, and access to, multi-hazard early warning systems and disaster risk information and assessments to the people.[14]

[13] Sendai Framework for Disaster Risk Reduction 2015 - 2030. (n.d.). Retrieved from http://www.preventionweb.net/files/43291_sendaiframeworkfordrren.pdf

[14] Sendai Framework for Disaster Risk Reduction - Wikipedia, https://en.wikipedia.org/wiki/Sendai_Framework_for_Disaster_Risk_Reduction (accessed June 20, 2017).

URCA considers that aiming for the seven global targets outlined in the Sendai Framework could substantially reduce losses of economic and social assets of the citizens in The Bahamas during natural disasters and national emergencies.

Question 3: Do you believe that URCA should seek to implement the seven global targets of disaster risk reduction identified in the Sendai Framework?

3.1.4 2nd Global Forum on Emergency Telecommunications

Lastly, the Telecommunications Development Bureau (BDT) of the ITU organized the 2nd Global Forum on Emergency Telecommunications (GET-2016), which recognized that*:*

> *Disasters disrupt national economies, severely weaken the poor and vulnerable and are recognized as major impediments to sustainable development and reduction of poverty especially in the least developed countries and small island developing states [such as The Bahamas]. The impact is even worse for those living in remote and isolated areas [like the southern family islands and cays] with no access to basic information and communications facilities that are essential to providing vital alerting information.*[15]

URCA recognises that ICT plays an integral role in disaster prediction, detection, and alerting. Therefore, URCA proposes to introduce regulatory measures that would ensure the unimpeded flow of vital information to critical infrastructure and essential services before, during, and after a disaster emergency.[16]

> ***Question 4: Do you agree that URCA should introduce regulatory measures that would ensure the unimpeded flow of vital information to critical infrastructure and essential services before, during, and after the occurrence of a disaster emergency?***

[15] Emergency Telecommunications - ITU, http://www.itu.int/en/action/emergency/Pages/default.aspx (accessed June 20, 2017).

[16] Emergency Telecommunications - ITU, http://www.itu.int/en/action/emergency/Pages/default.aspx (accessed June 20, 2017)

3.2 Review of The ITU Technical Guidelines and Recommendations

Recent events have shown that no country is safe from the threat of a catastrophe, though some may be more susceptible to natural and human-made disasters than others. The growing threat of a catastrophe has inspired multi-disciplinary research in the area of disaster management. One significant research finding is that ICT play increasingly important roles in all phases of disaster management. Also, research has shown that access to ICT has enabled government agencies, private organizations, and non-profit organizations to mobilize agile and flexible disaster response and recovery operations in disaster situations[17].

URCA proposes to implement regulatory measures to encourage service providers to strengthen the resilience of the communications infrastructure to mitigate damage and facilitate rapid recovery of essential communication services provided to the government and other organizations involved in disaster response.

> ***Question 5: Do you agree that URCA should implement regulatory measures to encourage service providers to strengthen the resilience of the communications infrastructure to mitigate damage and facilitate rapid recovery of essential communication services provided to the government and other organizations involved in disaster response?***

3.2.1 Technical Considerations for Disaster Management Activities

URCA is aware that disaster management consists of four phases, including mitigation, preparedness, response, and recovery. Each phase has a distinct and cohesive set of activities.

[17] Akemi Takeoka Chatfield, Jose J. Gonzalez and Tina Comes Introduction to ICT-enabled Crisis, Disaster & Catastrophe Management Minitrack. Retrieved from http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=6758844.

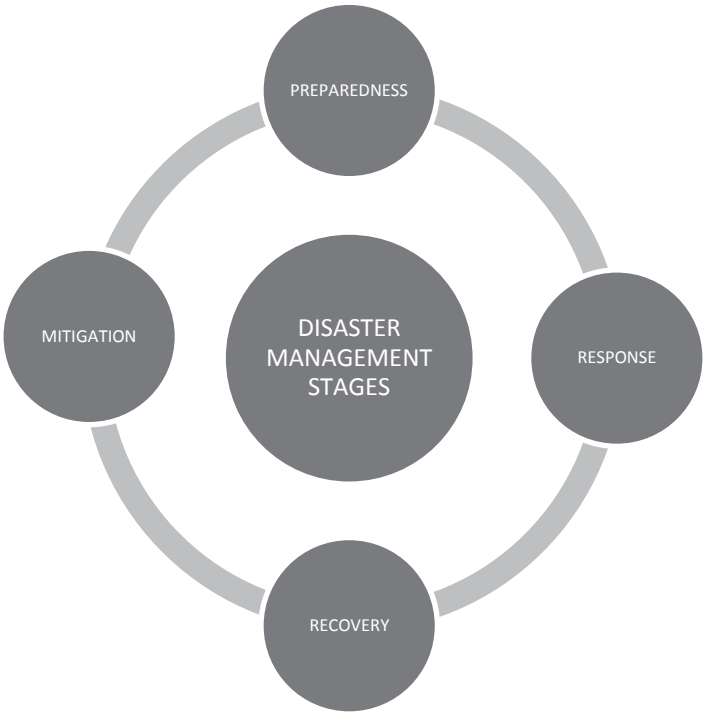

Figure 1: Disaster Management Cycle

Figure 1 shows the high-level activities of the various stages of disaster management. The specifics surrounding these critical activities are set out below:

i. mitigation includes observing and forecasting disasters in preparation for an impending disaster;
ii. preparedness includes providing knowledge and sharing methods for disaster management;
iii. the response includes collecting and transmitting rescue and evacuation information, and transmitting caution and warning messages; and
iv. recovery includes transmitting recovery information to victims and recovering communication network.

URCA believes that effective regulation in the ECS can facilitate disaster management by bridging gaps in the disaster response and recovery plan of extant CECI that would result in susceptibility to destruction, degradation or unavailability of electronic communications services needed during the various phases of disaster management. The critical electronic communications needs, which should be the focus of regulations, can be determined using gap analysis.

3.2.2. Gap Analysis

According to a gap analysis conducted by the ITU-T Focus Group on Disaster Relief Systems, Network Resilience, and Recovery (ITU FG-DR&NRR), early warning systems and disaster relief systems play a critical role in ensuring the delivery of warning notifications of an imminent disaster, providing information and coordinating support actions designed to reduce and suppress severe disruptions to the functioning of society. Table 1 below sets out the ICT systems identified as important disaster warning and relief systems.

Table 1: Critical Electronic Communications Infrastructure for Disaster Management

PHASE	Mitigation & Preparedness	Response	Recovery
DIRECTION OF INFORMATION FLOW	**EARLY WARNING SYSTEMS**	**DISASTER RELIEF SYSTEMS**	
Government Agency to General Public	TV Broadcasting	TV Broadcasting	TV Broadcasting
	AM/FM Radio broadcasting	AM/FM Radio broadcasting	AM/FM Radio broadcasting
	Digital Signage - shared	Digital Signage - shared	Digital Signage - shared
	Fixed electronic communications - dedicated	Fixed electronic communications- dedicated	Fixed electronic communications – dedicated
Government Agency to Government Agency	Fixed electronic communications - dedicated	Fixed electronic communications- dedicated	Fixed electronic communications – dedicated
	Satellite communications with a fixed land station – dedicated	Satellite communications with a fixed land station - dedicated	Satellite communications with a fixed land station – dedicated
			Satellite communications with a mobile land station – dedicated
Government agency to people within the Agency		Mobile phone communications - dedicated	Mobile phone communications - dedicated
		Fixed phone communications - Dedicated	Fixed phone communications - Dedicated
		Safety confirmation and message broadcast	Safety confirmation and message broadcast
Government agency to Individual	Mobile broadcast to phone – shared	Mobile broadcast to phone - shared	Mobile broadcast to phone – shared
	Fixed electronic communications - dedicated	Disaster relief guidance - dedicated	Disaster relief guidance - dedicated
		Mobile phone - Shared	Mobile phone – shared

Individual to Government Agency		Fixed-phone communications-shared	Fixed-phone communications shared
		Amateur Radio - shared	Amateur Radio – shared
Individual to Individual			Disaster message board - dedicated
			Disaster voice delivery - dedicated

3.2.3 Critical Electronic Communication Infrastructure

URCA considers that to maximize the effectiveness of The Bahamas' early warning and relief infrastructure its regulatory framework should aim to ensure the availability of the early warning systems and relief systems services as set out in Table 1. Therefore, URCA proposes to designate certain key networks and service providers as Critical Electronic Communications Infrastructure Providers (CECIP) and to implement regulatory measures to ensure or maximize the availability of that infrastructure in the event of a disaster.

URCA proposes to designate the following network and services providers as CECIP:

i. a provider of a public electronic communications network [18];
ii. a provider of a public electronic communications service [19]; or
iii. a public service broadcaster including radio and television broadcaster;

[18] A provider of a public network includes satellite system dedicated to disaster management, fixed radio communications networks dedicated to disaster management, satellite dedicated to disaster management, meteorological systems, cellular mobile networks, and fixed or landline telephone networks, safety confirmation and message broadcast systems, disaster relief guidance to disaster management, disaster message boards and disaster voice delivery.

[19] A provider of a public electronic communications network, includes satellite system dedicated to disaster management, fixed radio communications networks dedicated to disaster management, satellite dedicated to disaster management, meteorological systems, cellular mobile networks, and fixed or landline telephone networks, safety confirmation and message broadcast systems, disaster relief guidance to disaster management, disaster message boards and disaster voice delivery.

iv. a person or entity who makes available facilities that are associated facilities by reference to a public electronic communications network or a public electronic communications service; and

v. a person or entity that is considered to form part of the CECI.

The terms used in this section shall have the meaning ascribed to them in accordance with section 2 of the Comms Act. For the avoidance of doubt, CECI Provider or Service includes both fixed and mobile service providers, their services and their networks.

Question 6: Do you agree that URCA should identify the critical electronic communications infrastructure in The Bahamas and propose regulations designed to increase the probability that the critical electronic communication networks and services will be available before, during and after a disaster emergency in The Bahamas?

Question 7: Do you agree that the providers and licensees listed in Section 3.2.3 of this document form the critical electronic communications infrastructure?

3.2.4 Gap Analysis for Resilience and Recovery Systems

As previously mentioned, URCA is of the view that disaster management regulation of electronic communication networks and providers should aim to improve network resilience, promote rapid recoverability and ensure the transmission of critical information between essential resources including public and private organizations, the public, and the mass media.

Different measures are necessary to ensure network resilience and facilitate network recovery. Table 2 sets out some of the specific measures needed to ensure network resiliency and rapid recovery.

Table 2: Network resiliency and recovery measures

PART OF THE NETWORK	PREPAREDNESS BEFORE DISASTER	RESPONSE AND RELIEF AT AND DURING DISASTER	RECOVERY AFTER DISASTER
	NETWORK RESILIENCY (REDUNDANCY AND CONGESTION CONTROL)		NETWORK RECOVERY (SUBSTITUTE NETWORKS AND REPAIR)
Satellite	Increase in switching capacity at satellite		Portable earth station to reach a satellite
			Mobile Base station with satellite entrance
Core Network	Spares for switching equipment and transmission facilities		Spares for switching equipment and transmission facilities
	Multiple routes for transmission facilities		Material for makeshift (emergency restoration construction, installation of temporary telecommunications lines, electric power supply
	Installation of a fault detection device		Emergency restoration equipment (outdoor line trunk accommodation units temporary repeater
	Installation of congestion detection and traffic control function		Movable and deployable ICT resource units
	Installation of automatic fire alarms and extinguisher systems		
	Secure facilities to a stable structure robust against collapse		
	Stable outdoor facilities and robust building to ameliorate the effects of disasters		
	Increase in switching capacity		
	Emergency priority voice call		
	Flexible allocation of network resources (including relevant processing resources)		
Fixed Access & Terminal Equipment	offload voice calls to other media (text messages, email, the Internet, storage-type media for emergency situations, packet communications)		Special toll-free public phones
	IP Phones		Satellite mobile phones
			Repurpose resources from other station (laying in a cable from other areas and out-rigging of the network facilities
			Underground multi-purpose cable duct
	Offload voice calls to other means (text messages, email, the Internet, storage-type		Large zone (long reach mobile base stations

PART OF THE NETWORK	PREPAREDNESS BEFORE DISASTER	RESPONSE AND RELIEF AT AND DURING DISASTER	RECOVERY AFTER DISASTER
	NETWORK RESILIENCY (REDUNDANCY AND CONGESTION CONTROL)		NETWORK RECOVERY (SUBSTITUTE NETWORKS AND REPAIR)
Mobile Access & Terminal Equipment	media for an emergency, packet communications)		
	Mobile IP Phones		Mobile and compact base stations (including femtocells)
	Send SMS over the data transmission network		Satellite mobile phones
Internet Access	Increase line capacity to ensure Internet connectivity		Free access to wireless LAN and Internet including in evacuation centres
	Bandwidth		Autonomous network construction for continuous communication (delay) tolerant networking, local wireless mesh network with a portable advanced wireless base station
	Distributed Internet exchange (IX) and data centres over a wide geographical area		
	Mirror Sites		
	User experience improvements with unstable or intermittent network connectivity		
Electric Power Supply	Spare power supply		Power supply car
	Backup generators or batteries		

Based on the finding set out in Table 2, URCA proposes to bridge the gaps by introducing regulatory measures that will encourage network redundancy, limit traffic congestion, and facilitate network recovery.

Question 8: Do you agree that URCA should introduce regulatory measures that will encourage network redundancy, limit traffic congestion, and facilitate network recovery?

3.2.5 Business Continuity Plan

URCA considers that to implement the propositions set out in this section, the CECIP must create and maintain a Business Continuity Plan (BCP), which should be subject to URCA's review and approval to ensure that it achieves the objectives of URCA's disaster preparedness and management regulatory framework. This BCP should be a living document that should set

out the CECIP's strategic approach to improving the resilience of the electronic communications network and ensure service sustainability by continually assessing, planning, building, simulating and reviewing the BCP. At a minimum, the BCP should include an ICT Disaster Recovery (ICT DR) Plan, a Business Impact Analysis (BIA), and a Risk Assessment. The ICT DR Plan should consist of a documented recovery strategy, crisis management process, and testing and maintenance schedules of the organization. Further, the recovery strategies should include an explicit DR accountability component, risk assessment component, and a BIA component. The purpose of the BIA is to establish a process for identifying critical services, prioritizing the delivery of those services, and determining the resources needed to support service delivery. This process can support investment decisions regarding the improvement of network resiliency and recoverability. Also, the BIA support decisions regarding the service maintenance required to minimize periods of disruption and prioritize restoration activities[20]. At a minimum, the BIA should aim to identify:

- critical and non-priority services;
- risks associated with service failure;
- service priorities, evaluating impact over time;
- critical resources and infrastructure including ICT, people, buildings, and utilities;
- suppliers needed to ensure service delivery and the risks associated with lack of access to those suppliers;
- opportunities, weaknesses, and threats to business continuity from a supply chain perspective; and
- gaps in the delivered quality of services and customer expectations[21].

Also, the BIA should identify the potential impact of the disaster on business operations. For example, a disaster could consist of failure of a particular element of the ICT infrastructure, like a server or voice switch. Additionally, a major disaster can disable entire facilities, multiple

[20] Business Continuity Management and ICT Disaster Recovery ... (n.d.). Retrieved from https://www.qgcio.qld.gov.au/products/qgea-documents/3197-business-continuity-ma

[21] Business Continuity Management and ICT Disaster Recovery ... (n.d.). Retrieved from https://www.qgcio.qld.gov.au/products/qgea-documents/3197-business-continuity-ma

sites, or critical systems that form part of those facilities or sites. Hence, the BIA should address issues such as the:

i. loss of one or more sites;
ii. loss or technical failure of one or more network servers;
iii. loss or technical failure of network infrastructure;
iv. loss or technical failure video, voice or data infrastructure;
v. loss of electrical power; and
vi. failure of a critical software system.

Table 3: contains a summary of the critical components of the Business Continuity Plan

BC/DR Accountability	**Risk Assessment**	**Business Impact Analysis**	**Developing Recovery Strategies**	**Developing the DR Plan**	**Testing and Maintenance**
Define the sponsor of the DR at the highest seniority level in the organization	Review the potential disruptions	Identify the potential impact of the disaster on business operation	Identify and document alternative recovery strategies for backup, alternate sites, and equipment replacement.	Crisis management organization structure and process (including stakeholder notification and recovery team notification)	Testing objectives
Define a Business Continuity Function with a clear role and scope within the organization	Prioritize risks based on severity and likelihood of occurrence	Establish allowable outage time	Identify resources required for resumption and recovery	Content of DR plan • Introduction • notification/Activation Phase • Recovery Phase • Reconstitution Phase • Appendices	Testing options •Orientation •Tabletop •Functional testing •Full-scale testing
	Specify the definition of specific scenarios	Prioritize the critical business processes	Perform a cost-benefit analysis to identify the optimum recovery strategy		Test Execution
		Establish the recovery objectives for critical business processes			Result analysis

3.2.6 Consideration of National Roaming for Resilience

The infrastructure of a telecommunications network operator often sustains damages during disasters and disaster emergencies. These caused by disasters and disaster emergencies can create a significant business continuity issue if the damages result in network failure because network failure can hamper the network operator's ability to deliver services to and from customers in the impacted areas. Moreover, telecommunication network failure can worsen the impact of the disaster and frustrate the relief and recovery efforts.

URCA considers that national roaming can mitigate disaster relief and recovery problems that are consequential to any network failures caused by disasters and emergencies. As proposed by the European Union Agency for Network and Information Security (ENISA), the implementation of a national roaming policy, which could become effective during and after disasters and emergencies, would enable mobile users served by a network operator to make or receive calls, send or receive mobile messages (SMS and MMS), and access other services including Internet and broadband services from an alternative national mobile network operator[22]. URCA considers that national roaming could mitigate the impact of service outages on the operator's key stakeholders by improving the probability that impacted individuals will have access to essential electronic communication services despite the operator's inability to deliver services to and from its customers in the impacted areas.

3.3 Consideration of Reporting Requirements

Reporting is a critical component of disaster management. Therefore, reporting requirements should be a component of any proposed regulation seeking to facilitate the restoration of ICT in the aftermath of disasters and national emergencies. Further, reporting should be premised on geographic location and consider:

- the disproportionate dispersion of the electronic communications networks and facilities across the islands of The Bahamas; and
- factors such as population density and the location of CECI.

Having regard for the preceding, URCA is of the view that the reports from CECIPs relating to recovery efforts should be subdivided as follows:

[22] European Union Agency for Network and Information Security. (2013). National roaming for resilience. Retrieved from https://www.enisa.europa.eu/publications/national-roaming-for-resilience/at_download/...

i. Reporting Area 1: New Providence subdivided into the constituencies and boundaries defined by The Parliamentary Registration Department of The Government of the Bahamas;
ii. Reporting Area 2: Grand Bahama subdivided into the constituencies and boundaries defined by The Parliamentary Registration Department of The Government of the Bahamas;
iii. Reporting Area 3: Abaco, Eleuthera, Exuma and Andros into the constituencies and boundaries defined by The Parliamentary Registration Department of The Government of the Bahamas; and
iv. Reporting Area 4: All other islands into the constituencies and boundaries defined by The Parliamentary Registration Department of The Government of the Bahamas.

All CECIPs should submit periodic reports to URCA that provide current information about the recovery of facilities and services listed in the BIA. CECIPs should continue the submission of reports until the services have been fully restored.

3.4 Summary of Context

The context highlights the potential of disaster and disaster emergencies to disrupt the economic and social welfare of a country significantly. Further, it highlights the importance of ICT and suggests that regulations should aim to promote resilience, availability, and recoverability of critical electronic communications infrastructure in the wake of a 'disaster' and 'disaster emergency.' Additionally, the context suggests that sector regulations should concurrently address disaster mitigation, disaster preparation, disaster response, and disaster recovery as such an approach would promote service sustainability. Also, research showed that a BCP which includes the following elements are required:

i. a strategy, inclusive of a business impact analysis, aimed at reducing risks to information and ICT assets;
ii. a BCP which is upheld and tested to ensure information and ICT assets are consistent with the CECIP service level agreement;
iii. an ICT DR Plan that is upheld and tested to ensure information and ICT assets are available and consistent with agency business and service level requirements; and

iv. plans and processes to assess the risk and impact of the loss of information and ICT assets in the event of a security failure or disaster to enable information and ICT assets to be restored or recovered23.

Question 9: Do you agree that URCA should require CECIP to submit a Business Continuity Plan (BCP) for URCA's approval?

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[23] Business Continuity Management and ICT Disaster Recovery ... (n.d.). Retrieved from https://www.qgcio.qld.gov.au/products/qgea-documents/3197-business-continuity-ma

4 ASSESSMENT OF REGULATORY OPTIONS

In this Section, URCA assesses the regulatory options considered in respect of the matters that are the subject of this consultation process. URCA's primary aim is to further the overall ECS Policy objectives and the interests of stakeholders in The Bahamas. Given this, URCA has considered the following regulatory options:

Option 1: The 'Do Nothing' Option (i.e., maintain the status quo)

URCA may take a "Do Nothing' approach. This option should be taken where URCA considers that market forces will cause the advancement of the ECSP objectives or when cost implications are unfavourable. However, as previously noted, URCA finds that the 'Do Nothing' approach in this regard:

i. poses an enormous risk to the economic and social sustainability of The Bahamas, the Bahamian public and the electronic communications infrastructure which supports economic and social sustainability;
ii. disregards the recommendation from reputable international bodies including the United Nations, ITU and CARICOM; and
iii. does not reflect a proactive approach considering that The Bahamas could be potentially impacted by future disasters and/or disaster emergencies as in the case of the devastations that occurred in other island nations in the Caribbean such as Barbuda, Barbados, Dominica, Puerto Rico, and the Virgin Islands.

Option 2: The Proposed Regulatory Measure Option

Alternatively, URCA may advance the ECS Policy objectives by proposing regulatory measures. It is URCA's view that market forces will not achieve the ECS Policy objectives, particularly during disasters and disaster emergencies. URCA's view is supported by actual licensee reports of widespread damages to electronic communications infrastructure in several islands of The Bahamas during hurricanes Joaquin (2015), Matthew (2016), Irma (2017), Maria (2017) and Dorian (2019). The reports were submitted by several electronic communications service providers. Further, the experiences of other Caribbean islands such as Antiqua and Barbuda, Dominica, Puerto Rico, US Virgin Islands, and Turks and Caicos, whose critical communications infrastructure suffered catastrophic damage and remained unrestored for several weeks in the

wake of Hurricane Irma, provide further evidence to buttress this option. As a result, the importance of regulatory intervention had been emphasized.

Therefore, URCA considers that suggestions in Section 3, if implemented, will further the ECSP objectives. URCA is confident that the proposed Regulations as specified in Section 5 of this consultation document are consistent with principles set out in section 5 of the Comms Act and are in compliance with the guidelines set out in subsections (a), (b) and (c) of section 5.

Further, URCA believes that the proposed positions are:

- Applicable to all providers of data/internet communications services, regardless of technology or the service provider's position in the broader market. This ensures compliance with the non-discriminatory principle of the Comms Act;
- Transparent by virtue of this public consultation process and URCA's standard practice of publicising its final decision on any matter of public significance;
- Proportionate having regard to the ECSP objectives and URCA's reasoning in Section 5 below; and
- An efficient way of achieving their purpose. URCA reiterates that the measures contemplated are in line with the international mainstream.

5. PROPOSED DISASTER MANAGEMENT REGULATIONS

In this section, URCA sets out the draft Disaster Management Regulations for the Electronic Communications Sector (ECS) in The Bahamas.

Part 1 Introduction

1.1 In exercise of the powers and duties conferred upon it by section 8(1)(d) of the Communications Act, 2009 (Comms Act), the Utilities Regulation and Competition Authority ("URCA") hereby issues the following Regulations. These Regulations may be cited as the "*Disaster Management Regulations for the Electronic Communications Sector in The Bahamas*."

1.2 The purpose of these Regulations is to ensure network resilience and encourage the rapid restoration of Critical Electronic Communications Infrastructure and services after a disaster or national emergency, thereby furthering the interests of persons in The Bahamas in relation to the ECS.

1.3 These Regulations designate certain electronic communications networks, systems, and services as critical electronic communications infrastructure in The Bahamas, and mandate specific regulatory requirements which must be complied with by critical electronic communications infrastructure providers, to ensure adequate network resilience and service recoverability of the Critical Electronic Communications Infrastructure, particularly in the event of a natural disaster.

Part 2 Interpretation

2.1 In these Regulations, unless the context requires otherwise, the following terms shall have the meaning ascribed below:

"Critical Electronic Communications Infrastructure (CECI)" refers to the following network and services providers:

vi. a provider of a public network[24];

vii. a provider of an electronic communications service[25]; or

viii. a public service broadcaster, including radio and television broadcasters;

ix. a person or entity who makes available facilities essential to the provision of an electronic communications service and a public network; and

x. a person or entity that is considered to form part of any of the above-listed providers and services.

"Critical Electronic Communications Infrastructure Providers (CECIP)" refers to a Licensee whose network, service or system, or any part of it, has been designated under these Regulations as CECI;

"Disaster" shall have the meaning attributed to it in Schedule Two of the Disaster Preparedness and Response Act;

"Disaster emergency" shall have the meaning attributed to it in section 27(a) of the Disaster Preparedness and Response Act;

"First Level Responders" shall include the National Emergency Management Agency (NEMA) and communications centers and shelters established by MoDP, NEMA, Local Government Administration Offices, The Royal Bahamas Police Force, The Royal

[24] A provider of a public network includes satellite system dedicated to disaster management, fixed radio communications networks dedicated to disaster management, satellite dedicated to disaster management, meteorological systems, cellular mobile networks, and fixed or landline telephone networks, safety confirmation and message broadcast systems, disaster relief guidance to disaster management, disaster message boards and disaster voice delivery.

[25] A provider of a public electronic communications network, includes satellite system dedicated to disaster management, fixed radio communications networks dedicated to disaster management, satellite dedicated to disaster management, meteorological systems, cellular mobile networks, and fixed or landline telephone networks, safety confirmation and message broadcast systems, disaster relief guidance to disaster management, disaster message boards and disaster voice delivery.

Bahamas Defence Force, Port Department, Fire and Ambulance Services, The Public Hospital Authority, The Department of Meteorology, Bahamas Civil Aviation Authority, The Broadcasting Corporation of The Bahamas and such other persons or organizations required by law to perform functions related to the mitigation of and response to emergencies and disasters in The Bahamas.

"ICT" means Information and Communication Technology;

"Resilience" means the ability of an organization to maintain business or service continuity to the end-user before during and after a disaster emergency.

"Reporting Areas" shall, unless modified by URCA in accordance with these Regulations, be as follows:

i. Reporting Area 1: New Providence subdivided into the constituencies and boundaries defined by The Parliamentary Registration Department of The Government of the Bahamas;
ii. Reporting Area 2: Grand Bahama subdivided into the constituencies and boundaries defined by The Parliamentary Registration Department of The Government of the Bahamas;
iii. Reporting Area 3: Abaco, Eleuthera, Exuma, and Andros subdivided into the constituencies and boundaries defined by The Parliamentary Registration Department of The Government of the Bahamas; and
iv. Reporting Area 4: All other islands subdivided into the constituencies and boundaries defined by The Parliamentary Registration Department of The Government of the Bahamas.

2.2 Other terms used shall, unless otherwise expressly defined herein, have the meanings ascribed in section 2 of the Comms Act.

Part 3 Application

3.1 These Regulations shall apply to licensees that have been issued an Individual Licence or Class Licence by URCA and whose public network, and electronic communications services or system are designated critical electronic communications infrastructure (CECI) in accordance with section 3.2 of this Part.

3.2 Subject to section 3.1, the public networks, electronic communications services, and systems listed below are designated as CECI:

i. a provider of a public electronic communications network;
ii. a provider of a public electronic communications service;
iii. a public service broadcaster including radio and television broadcaster;
iv. a person or entity who makes available facilities that are associated facilities by reference to a public electronic communications network or a public electronic communications service; and
v. a person or entity that is considered to form part of the CECI.

3.3 The holder of an Individual Licence, or Class Licence by URCA and whose public networks, and electronic communications services or system are designated as critical electronic communications infrastructure (CECI) in accordance with section 3.2 of this Part shall be referred to as a critical electronic communications infrastructure provider (CECIP).

Part 4 Governance

4.1 URCA shall have responsibility for the governance of these Regulations.

4.2 URCA may establish a multi-stakeholder industry group, which will be referred to as the Electronic Communications Sector Disaster Management Stakeholder Group (the "Disaster Management Stakeholder Group") whose purpose will be to assist URCA with determining approaches for the regulation of CECI with an aim to:

i. reduce disaster and disaster emergency mortality in The Bahamas;

ii. lessen the number of people affected by disaster and disaster emergencies in The Bahamas;

iii. reduce direct disaster economic loss in relation to the global gross domestic product (GDP);

iv. reduce disaster damage to critical infrastructure and disruption of basic services, among them financial, health and educational facilities;

v. improve the number of islands for which electronic communications service providers have a local business continuity and disaster recovery plan;

vi. increase the availability of multi-hazard early warning systems, and the public's access to disaster-related information; and

vii. enhance international co-operation regarding disaster preparedness and management. [26]

4.3 The ECS Disaster Management Stakeholder Group shall consist of representatives from URCA, at least one representative from Licensees designated as Critical Electronic Communications Infrastructure Providers (CECIP) and at least one representative from the Ministry of Disaster Preparedness, Management and Reconstruction, National Emergency Management Agency, Department of Meteorology, Data Protection Commission, Royal Bahamas Police Force, Royal Bahamas Defense Force and other relevant government offices and departments, as determined by the ECS Disaster Management Stakeholder Group.

4.4 The ECS Disaster Management Stakeholder Group shall meet a minimum of three (3) times a year and may meet more regularly if determined by the ECS Disaster Management Stakeholder Group.

[26] Sendai Framework for Disaster Risk Reduction - Wikipedia, https://en.wikipedia.org/wiki/Sendai_Framework_for_Disaster_Risk_Reduction (accessed June 20, 2017).

Part 5 Special Provisions

5.1 A critical electronic communications infrastructure provider (CECIP) shall enable national roaming on its network in the impacted area immediately after the appropriate government agency issues a warning that a national emergency or national disaster will occur within twenty-four hours, and national roaming shall continue until such time as URCA directs the CECIP in writing to discontinue national roaming in the affected area.

5.2 Provided that authorization is obtained from URCA prior to establishing, operating, and maintaining an electronic communications system during a disaster or disaster emergency, URCA may:

i. exempt specified electronic communications resources from certain regulatory measures if the resources are used for disaster mitigation and relief;

ii. pre-clear electronic communications resources for use in disaster mitigation and relief, in compliance with the regulations;

iii. expedite the review of electronic communications resources for use in disaster and disaster emergencies, in accordance with extant regulations; and

iv. temporarily waive regulations for the use of electronic communications resources for disaster mitigation and relief. [27]

Question 10: Do you agree with the Special Provisions set out in Part 5 of the Proposed Regulations?

Part 6 Disaster Preparedness

6.1 A CECIP shall, within three months after the publication of these Regulations:

[27] 9824645E, https://treaties.un.org/doc/source/RecentTexts/25-4eng.htm (accessed June 20, 2017).

i. Develop and implement procedures to improve Disaster Preparedness to improve the resilience of its networks against potential threats. The procedures implemented by the CECIP shall be detailed in the DR report to be submitted to URCA in accordance with the requirements of Part 9 for consideration;

ii. liaise with the Bahamas Power and Light Company Ltd. (BPL) to coordinate priority notification of potential power outages; and

iii. establish repair teams that can be quickly deployed in the aftermath of a disaster for rapid restoration and repair of any damaged electronic communication facilities.

Question 11: Do you agree with the timeframe set out in Part 6.1 of the Proposed Regulations? If not, propose an achievable timeframe.

6.2 A CECIP shall ensure the security and resilience of its network and services against potential disaster emergencies by implementing the following:

i. *Business Continuity Plan*: CECIPs shall create a strategic plan for improving business resilience and service sustainability during disasters and disaster emergencies.

ii. *Telecommunications Asset Management*: CECIPs shall maintain appropriate protection of CECI.

iii. *Physical Security*: CECIPs shall prevent unauthorized physical access, damage, and interference to CECI.

iv. *Communications and Operations Management*: CECIPs shall ensure the correct and secure operation of CECI.

v. *Information Security*: CECIPs shall ensure the safeguarding of information in networks and the secure operation of information processing facilities.

6.3 In addition to the Section 6.2 requirements listed above, an existing CECIP whose CECI include a fixed-line network shall, within eighteen months of the issuance of these Regulations demonstrate to URCA that it has improved the resilience of that network by incorporating at a minimum the:

i. Use of diverse routing and dynamic re-routing on failure. The fixed-line CECIP should ensure that there are no common ducts or switches and that ideally, except for very few points (usually close to termination), the routes are several miles apart (to ensure that they are not simultaneously taken out by a disaster);

ii. Use of network physical layer technologies based on self-healing rings like SDH (Synchronous Digital Hierarchy);

iii. Use of high availability equipment. All switches and critical exchange equipment should be high availability with automated failover/fallback; and

iv. where there is not a diversely routed backup submarine cable, the CECIP should arrange for backup land routes to redirect traffic if the submarine cable is cut.

6.4 Licensees that establish CECI after the publication of these regulations must comply with the condition set out in 6.3(i) through 6.3(iv) from the date such Licensee commences service delivery in The Bahamas.

6.5 In addition to the Section 6.2 requirements listed above, all mobile CECIPs shall further improve the resilience of their networks by considering the following:

i. For higher resilience of Mobile Switching Centers (MSCs):
   a. have duplicate MSCs in critical areas; and
   b. in non-critical areas, have overlaps in the geographic coverage between MSCs, and keep spare capacity in all MSCs to allow switching of traffic between the MSCs within the network.

ii. Establish a backup Home Location Register (HLR) for each production HLR and locate it at a different site. All updates to the primary HLR should be mirrored at the backup unit.

iii. Deploy a hot standby unit containing a backup Visitor Location Register (VLR) at each MSC.

iv. Deploy transportable (mobile) base stations (BSs) to cover for failing fixed BSs in locations within the networks, where duplicate or overlapping BSs don't exist.

Part 7 Disaster Recovery

7.1 Every CECIP shall, within three months from the publication of these Regulations submit, for URCA's approval, a Business Continuity Plan that makes best efforts to ensure the continuous provision of electronic communications services during all phases of a disaster or disaster emergency and shall include:

i. a Disaster Recovery (DR) Plan;

ii. a Stakeholder Notification (SN) Plan; and

iii. a Business Impact Analysis.

URCA may require the CECIP to make necessary amendments to any DR or SN Plan and re-submit any report or part thereof as a consequence of such amendment before granting approval.

Question 12: Do you agree with the timeframe set out in Part 7.1 of the Proposed Regulations? If not, propose an achievable timeframe.

7.2 The CECIP shall:

i. identify one representative from senior management that shall have overall responsibility for implementation of its DR Plan; and

ii. take necessary actions to ensure the safety of its employees and agents on active duty during a disaster or disaster emergency.

7.3 The CECIP shall test its DR Plan at least once every two years.

7.4 The CECIP shall invite URCA to attend the full-scale testing of its DR Plan once every two years after the publication of these Regulations.

Part 8 Reporting

8.1 Following any Disaster or Disaster Emergency, every CECIP shall submit a Report to URCA setting out:

i. all network and services outages caused by a disaster or disaster emergency and the impact on its domestic and international services;

ii. the estimated time to repair and restore outages; and

iii. any outage that affects First Level Responders communication centres for 30 minutes or more.

8.2 The CECIP shall begin submitting the Report to URCA beginning on the sixth working day following the all-clear notification issued by the relevant Government agency. After that, the CECIP shall submit a Report daily by 12 noon. The Reports shall provide information current as at 4pm on the previous day (or later). The CECIP shall continue the submission of Reports until the CECIP's service(s) has been fully restored.

8.3 URCA may by the publication of a notice on its website, and by direct written notification to affected Licensees, extend or reduce the six working days or vary Reporting Areas defined in section 2 of these Regulations after considering the impact of the disaster or disaster emergency.

8.4 URCA may, at the request of a CECIP or on its own volition, permit a CECIP to combine two or more Reporting Areas in its reports. In considering whether to do so, URCA shall take into account, without limitation to URCA's discretion, the following factors:

i. the value of information about variations in the quality of service between separate Reporting Areas;

ii. the relationship between the network structure and corporate organization of the relevant Licensee, and the physical boundaries of the Reporting Areas;

iii. The number of customers using the relevant services in the Reporting Areas; and/or

iv. The difference in costs to the relevant Licensee that can result from taking measurements for separate Reporting Areas and taking measurements for combined Reporting Areas.

8.5 The CECIP shall advise the general public by publishing, by 12 noon, on the homepage of its website and/or in another appropriate media, a daily report on recovery efforts to restore services.

8.6 The daily report must be in the format set out in the attached Schedule 1, and shall include, at a minimum, the following information:

a. The name of each area impacted (each area shall be delineated based on the Licensee's network comprising groups of customers expected to be impacted and restored at or near the same time);
b. The number of customers impacted;
c. The nature of the interruption (e.g., poles/lines damaged, power supply interruption, tower destruction, etc.);
d. The date/time when services were interrupted in that area;
e. The date/time when which the licensee commenced or expected to commence work to restore services in that area;
f. The nature of the work being undertaken (e.g., restoration of lines, restoration of electronic communications systems and towers, restoration of power supplies, repair of nodes/transformers, etc.);
g. The expected date on which services will be restored; and,
h. Any other information which the licensee wishes to provide about service availability or restoration work.

8.7 URCA may publish in its Annual Report, on its website and/or in other appropriate media updates regarding the CECIPs service availability in areas affected by a disaster or disaster emergency.

PART 9 Billing

9.1 A CECIP shall not bill Government Agencies for provision of carriage services specifically related to the dissemination of messages from its early warning and disaster relief systems.

Part 10 Investigation

10.1 URCA may investigate the veracity of a CECIP's disaster management report under these Regulations in accordance with its powers under section 9(1) of the Comms Act

and may exercise its powers of information gathering under section 9(2) of the Comms Act, and the Conditions of the relevant license.

Part 11 Penalties

11.1 Any Licensee that contravenes or fails to comply fully with any provision of these Regulations shall be liable to a fine, other penalty or enforcement action to be determined by URCA in accordance with the provisions of the Comms Act.

Question 13: Please provide comments to any of the Proposed Regulations? Are there additional rules that URCA should include in the Proposed Regulations?

6 CONCLUSION AND NEXT STEPS

URCA invites responses to this Consultation Document from interested parties. After receiving responses on or before 5 p.m. on 19 May 2020, URCA will**:**

i. issue a Statement of Results and Final Decision responding to all comments and representations received to this Consultation Document within thirty (30) calendar days of the closing date for receipt of comments; and

ii. simultaneously issue the Statement of Results and Final Regulations.

SCHEDULE 1

OPERATOR NAME:

SERVICE RESTORATION UPDATE: [Insert Update Number]

DATE:

Service Area/Location Impacted	**Total Number of Customers in Service Area**	**Date/Time of Service Interruption**	**Number of Customers Impacted**	**Description of Service and Interruption (e.g., Fixed/ Mobile/ Pay-TV/ Electricity Service - Cabling Cut, Tower Damage. Transformer, etc.)**	**Date/Time Restoration Work Commenced**	**Number of Customers Restored to Date**	**% Restored**	**Estimated Date for a complete restoration.**

ANNEX: LIST OF PUBLIC CONSULTATION QUESTIONS

Question 1: Do you agree that URCA should aim to remove regulatory barriers during a disaster emergency?

Question 2: Do you agree that public-private partnerships could ensure the availability of the communications infrastructure, the relaxation of communication congestion, early recovery of communication, and the use of satellite communications systems in times of disaster?

Question 3: Do you believe that URCA should seek to implement the seven global targets of disaster risk reduction identified in the Sendai Framework?

Question 4: Do you agree that URCA should introduce regulatory measures that would ensure the unimpeded flow of vital information to critical infrastructure and essential services before, during, and after the occurrence of a disaster emergency?

Question 5: Do you agree that URCA should implement regulatory measures to encourage service providers to strengthen the resilience of the communications infrastructure to mitigate damage and facilitate rapid recovery of essential communication services provided to the government and other organizations involved in disaster response?

Question 6: Do you agree that URCA should identify the critical electronic communications infrastructure in The Bahamas and propose regulations designed to increase the probability that the critical electronic communication networks and services will be available before, during and after a disaster emergency in The Bahamas?

Question 7: Do you agree that the providers and licensees listed in Section 3.2.3 of this document form the critical electronic communications infrastructure?

Question 8: Do you agree that URCA should introduce regulatory measures that will encourage network redundancy, limit traffic congestion, and facilitate network recovery?

Question 9: Do you agree that URCA should require CECIP to submit a Business Continuity Plan (BCP) for URCA's approval?

Question 10: Do you agree with the Special Provisions set out in Part 5 of the Proposed Regulations?

Question 11: Do you agree with the timeframe set out in Part 6.1 of the Proposed Regulations? If not, propose an achievable timeframe.

Question 12: Do you agree with the timeframe set out in Part 7.1 of the Proposed Regulations? If not, propose an achievable timeframe.

Question 13: Please provide comments to any of the Proposed Regulations? Are there additional rules that URCA should include in the Proposed Regulations?