

[COMPANY NAME]

**Complex Commercial SATCOM Solutions (CS3)
Corporate Climate Risk Management Plan**

Prepared for:

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1. Introduction

Executive Order (EO) 13514 “Federal Leadership in Environmental, Energy, and Economic Performance” (2009) and EO 13653 “Preparing the United States for the Impacts of Climate Change” (November 2013) directed Federal Government agencies to update their plans to integrate consideration of climate change into agency operations and overall mission objectives.

The General Services Administration (GSA) has a leading role in ensuring that the Federal Government is better prepared to cope with the consequences of climate change that present many serious risks for government operations. These risks include damage to facilities and equipment and disruptions to communications networks. A 2014 report prepared for GSA¹ presented information and data on climate change variability and impacts. Figure 1-1 (The low, medium, and high potential for different climate variables and impacts to have a negative impact on information and communications technology (ICT) infrastructure, including data centers (Engineering the future,2011) from this study (shown below) includes infrastructure associated with the design and operations of satellite communications services.

ICT INFRASTRUCTURE AFFECTED	High temp		Low temp		Water table rise		Sea level rise		Storm surge		Prolonged rainfall		Flood		Drought		Snow		Extreme wind		Electric storm		Frost		Fog		Soil shrinkage	
	D	P	D	P	D	P	D	P	D	P	D	P	D	P	D	P	D	P	D	P	D	P	D	P	D	P	D	P
	Telephone exchanges	L	L	L	L	H	U	L	L	L	L	L	L	H	U	L	L	L	L	L	L	H	L	L	L	L	L	L
Telephone poles	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	M	M	H	M	H	L	M	M	L	L	L	L
Satellite earth stations	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	M	M	H	M	M	L	L	L	L	L	L	L
Mobile base stations	M	L	L	L	U	L	L	L	L	L	L	L	L	L	L	L	M	M	M	L	M	L	L	L	L	L	L	L
Data centres	M	M	L	L	H	U	U	U	U	U	U	U	H	U	L	L	L	L	L	L	M	L	L	L	L	L	L	L
Satellite-comms	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Satellite-gps	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Buried cables	L	L	L	L	U	U	L	L	L	L	L	L	U	U	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Ducts	L	L	L	L	U	U	L	L	L	L	L	L	U	U	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Terrestrial RF comms	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	M	L	M	L	U	U	L	L	L	L	L	L
Submarine comms	L	L	L	L	L	L	U	U	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Private infrastructure	U	L	L	L	U	U	U	L	L	L	L	L	M	L	L	L	L	L	L	U	U	L	L	L	L	L	L	L
Core network	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L

D – equates to damage, Low, Medium, High
 P – equates to probability, Low, Medium, High
 U – equate to unknown

Figure 1-1. Potential for Different Climate Variables and Impacts

¹ Climate Risks Study for Telecommunications and Data Center Services, Riverside Technology, Inc. and Acclimatise (2014)

The impact of gradual, incremental climate change on GSA's statutory mission is characterized differently from acute extreme weather incidents, which are handled reactively. Demand planning for changing climate risk factors supports the changing mission of the federal customers. GSA must be able provide services that are climate-resilient over time so that federal customers can operate at full capability.

The results of the Business Continuity Institute's November 2013 Supply Chain Resilience Survey, which covered 519 respondents from 71 countries, noted "the primary sources of disruption were unplanned IT or telecom outages, with 55% stating they experienced high or some impact from this type of disruption." These outages were ranked as the top cause of supply chain disruption for the financial and insurance services, professional services, public administration and defense, and information technology and communication services sectors. In addition, recent extreme weather events have caused significant costs to the telecommunications sector. For example, Superstorm Sandy in 2012 cost Verizon \$1 billion and was the single largest impact to its wire line infrastructure in its 100-year history².

1.1 Purpose

The Corporate Climate Risk Management Plan describes the <Company Name> approach for , identifying and addressing mitigation of, climate change risks to land based equipment and services associated with the design and operations of satellite communication services provided under the GSA Complex Commercial SATCOM Solutions (CS3) contract. The <Company Name> acknowledges the Corporate Climate Risk Management Plan is a post-award contract CS3 deliverable with the initial submission due 30 days after contract award and annual updates required.

1.2 Scope

The document discusses <Company Name> incorporates climate change adaptation strategies into risk-management programs to reduce property, infrastructure, and supply chain vulnerabilities. This includes identifying mission critical facilities, products and services, evaluating business operations and supply chains that may be vulnerable and anticipating needs that may arise from climate change. These climate change risks include sea level rise, extremes of temperature and precipitation, and increasing frequency and magnitude of intense storms.

1.3 Roles and Responsibilities

There are many roles associated with the Climate Risk Management process. System Owners for each information system are responsible for ensuring their respective systems utilized for delivery of COMSATCOM service have been evaluated for potential effects of Climate Risk. The following sections provide a high level description of the primary positions/roles within the organization who execute management and operational Climate Risk Management process responsibilities.

² GSA 2014 Climate Change Risk Management Plan

1.3.1 Company position with ultimate responsibility

Describe the Climate Risk Management responsibilities assigned to the Chief Executive Officer (CEO)/President/etc.

1.3.2 Other company positions with responsibility for Climate Risk Management

(Add as many positions as required.)

Describe the Climate Risk Management roles and responsibilities assigned to other personnel within the organization

2. Strategic Analysis

For the Climate Risk Management Plan, Strategic Analysis can be defined as the process of developing strategy for a business by researching the business and the environment in which it operates³. GSA's Strategic Planning is based in part on requirements established in the GPRA Modernization Act which requires agencies to develop: Strategic Plans, which include a mission statement, set out long-term goals, objectives, and strategic measures, and describe strategies to achieve them over a four-year time horizon; Annual Performance Plans, which provide annual performance measures and activities toward the long-term Strategic Plan; and Annual Performance Reports, which evaluate an agency's success in achieving the annual performance measures⁴.

Executive Order (EO) 13653 defines adaptation as an "adjustment in natural or human systems in anticipation of or response to a changing environment in a way that effectively uses beneficial opportunities or reduces negative effects."

Climate change adaptation is a qualitative, iterative process that addresses risk vulnerability, adaptive capacity, preparedness⁵, and resiliency⁶. It involves not only coping with immediate problems more efficiently, but also establishing and maintaining a reserve sufficient to cope with multiple (or more severe) stressors in anticipation of future changes. In essence, climate change adaptation requires building a robust capacity to manage risk.

The below text with **red font** from the GSA 2014 Climate Change Risk Management Plan provides information on strategic analysis. **Please read the guidance and describe how <Company Name> applies this guidance in conducting strategic analysis of climate risk (to include long-term goals and progress evaluation measures).**

Replace the text within the brackets [].

³ <http://www.businessdictionary.com/definition/strategic-analysis.html>.

⁴ GSA FY 2014-2018 Strategic Plan

⁵ "Preparedness" means actions taken to plan, organize, equip, train, and exercise to build, apply, and sustain the capabilities necessary to prevent, protect against, ameliorate the effects of, respond to, and recover from climate change related damages to life, health, property, livelihoods, ecosystems, and national security (EO 13653).

⁶ "Resilience" means the ability to anticipate, prepare for, and adapt to changing conditions and withstand, respond to, and recover rapidly from disruptions (EO 13653).

[GSA is engaged in managing acute and chronic climate risks for two primary strategic objectives - securing federal investments in real property and supply chains for products and services, and supporting the long-term mission continuity of our customers. GSA has relied on scenario planning for strategic development to generate risk management options. Implementation has revealed strategy execution barriers which, in their current form, hinder and frustrate progress to incorporate climate and adaptation factors across GSA.]

- **Limited understanding of climate risks** (Many agencies are struggling to understand the value or urgency of directing already limited resources towards identifying and addressing climate risks.)
- **Perceived lack of immediacy and relevance about climate risks** (Agency staff assume that climate change will not begin to impact GSA for many decades and therefore do not feel there is a need to develop strategies to address these risks today. It is also difficult for people across all organizations within GSA, and at all levels, to make the connection between their key business priorities (such as growth in sales, budgetary and time constraints, and cost savings), and the long-term need to prepare the business to adapt to the effects of climate change.)
- **Limited budgets and budget process** (Adaptation actions and strategies can be perceived as expensive, and it is unclear who should pay for them. Sometimes the benefits of investing in adaptation are outside the scope and timeframe of investment and budget decisions.)

3. Risks/Impacts

The below text with **red font** provides additional guidance on climate impacts associated with the telecommunications sector⁷. **Please read the guidance and describe how <Company Name> assesses these and other climate change risk to various infrastructure functions provided to the clients agencies such as network connectivity.**

Replace the text within the brackets [].

[Temperature

- *Increases in temperature and higher frequency, duration, and intensity of heat waves create an additional burden on keeping equipment cool, resulting in increased failure rates.*
- *Increases in mean temperature may increase the operating temperature of network equipment, leading to malfunction or premature failure if it surpasses design limits.*
- *Increases in temperature can stress telecommunications equipment and infrastructure, reducing life span.*
- *Increased energy demand during heat waves can result in power outages, which can affect the delivery of telecommunications services.*

Precipitation

⁷ Climate Risks Study for Telecommunications and Data Center Services

- *Increased precipitation (rain or snow) leads to a higher risk of flooding low-lying and underground infrastructure and facilities, as well as erosion or flood damage to transport structures, potentially exposing cables.*
- *Icing during rain may impact telecommunication lines and infrastructure.*
- *Decreased precipitation, in combination with increased temperatures, may increase the incidence of fires, which poses a risk to infrastructure, especially in rural or remote locations.*
- *Increased precipitation and humidity can affect the radio spectrum on which wireless communications rely. Rain and snow absorb signals at some frequencies; therefore heavy precipitation can result in some transmitted signals not being received clearly or at all. Some services may also require increased transmission powers in order to withstand poorer weather without experiencing outage. As a result, this could limit the number of users supported in a given spectrum band.*

Storms, Wind, and Extreme Events

- *Increases in storm frequency or intensity increase the risk of damage to above-ground transmission infrastructure (masts, antennae, switch boxes, aerials, overhead wires, and cables), which are often final access connections to homes and businesses, and may negatively impact telecommunications service delivery.*
- *An increase in storm frequency could lead to more lightning strikes, which can damage transmitters and overhead cables, causing power outages.*
- *Increased frequency and intensity of extreme weather events around the world increase the risk of interrupting materials supply (by disrupting air and sea transport) and manufacturing operations.*
- *Increased frequency and intensity of extreme weather events increase the risk of disruption to the electricity supply on which telecommunications rely.*
- *Extreme weather events may make it difficult for employees to get to work or for maintenance employees to access infrastructure, particularly in remote transmission networks.*

Humidity

- *Changes in humidity may lead to changes in patterns and rates of the corrosion of equipment.*
- *Higher levels of humidity may also lead to new dehumidification requirements to maintain internal environments within system tolerance ranges, as too much condensation can lead to short-circuiting or lead to water ingress.*

Sea-level rise

- *Rising sea levels and corresponding increases in storm surges increase the risk of saline corrosion of coastal telecommunications infrastructure as well as erosion or inundation of coastal and underground infrastructure.*
- *Sea-level rise may also lead to changes in the reference datum for some telecommunication transmission calculations.*

- *Rising sea levels will impact the operation of data centers and service centers upon which telecommunications rely.*]

4. Challenges

The below text with **red font** from the GSA 2014 Climate Change Risk Management Plan briefly describes some challenges for addressing climate change. **Please read the guidance and describe some of the <Company Name> challenges (e.g., resource requirements) and planned or ongoing actions to address these for climate risk management.**

Replace the text within the brackets [].

[Climate change adaptation planning efforts, which translate into future cost avoidance, seemingly align with GSA's actions over the past three year to reduce agency costs. However, the adaptation aspect of agency risk management is new and unfamiliar, the scope is extremely broad, and the return on investment is often uncertain and realized in the long term.

GSA and other federal agency staff struggle to understand how climate change presents risks to their supply chains. This is a challenge not only for adaptation staff, but also for agency leadership and management. While GSA strives to build awareness of climate risks in the supply chain through its training and pilot activities, staff still struggle to understand the risks and what they can, or should, do to manage the risks.]

5. Management Approach

Please discuss how the following organizational functional areas have been incorporated into the <Company Name> approach for climate risk management:

- **Enterprise Overview and Contingency Plan Constraints**
- **Mission and Architecture Overview**
- **Data Replication and Backup**
- **Contingency Plan Assumptions & Constraints**
- **Continuity of Operations Plan**
- **Backup and Recovery Procedures (Include Server File System Backups; Database Backups; and Recovery Procedures)**
- **Network Management and Operations**
- **Resource Requirements**
 - **People**
 - **Data**
 - **System Software**
System Software (Include operating systems and application system software)
 - **Hardware**
 - **Communications**
 - **Space Systems**
 - **Terrestrial**
 - **Teleports**

Appendix A: Acronyms

NOTE: Add additional acronyms (if required)

COMSATCOM	Commercial Satellite Communications
CS3	Complex Commercial SATCOM Solutions
EO	Executive Order
GPRA	Government Performance and Results Act
GSA	General Services Administration
ICT	Information and Communications Technology

Appendix B: References

Executive Order (EO) 13593, Planning for Federal Sustainability in the Next Decade (2015)
<https://www.fedcenter.gov/programs/eo13693>

EO 13653 Preparing the United States for the Impacts of Climate Change (2013)
<https://www.gpo.gov/fdsys/pkg/FR-2013-11-06/pdf/2013-26785.pdf>

Climate Risks Study for Telecommunications and Data Center Services, Riverside Technology, Inc. and Acclimatise (2014)
<https://sftool.gov/Content/attachments/GSA%20Climate%20Risks%20Study%20for%20Telecommunications%20and%20Data%20Center%20Services%20-%20FINAL%20October%202014.pdf>

Climate Change Risk Management Plan FY 2014 (with Progress Updates as of March 2015)
<https://www.gsa.gov/portal/content/162843>

GSA FY 2014-2018 Strategic Plan
<https://www.gsa.gov/portal/content/183023>