Chapter 3
Large Scale Physical Disruptions in the Electronic Communication Sector: Theory or Reality?

David Sutton
tacit.tel limited, UK

ABSTRACT

While small-scale disruptions that affect the electronic communications sector are frequent, their impact is generally relatively low, and recovery can be extremely fast. However, large-scale disruptions that have a major impact on the electronic communications sector are relatively uncommon. It is as a consequence of these two facts that Communications Service Providers (CSPs) place the majority of their effort (where possible) into the planning for prevention of small-scale disruptions, and recovery from those that do occur.

INTRODUCTION

This chapter examines a number of types of major disruption, all of which have resulted in serious consequences and the impact experienced as a result. It continues by examining how we view impact and likelihood, and concludes with a number of recommendations as to how CSPs might be better prepared for this type of low frequency, high impact disruption.

Whilst the main focus is on unintentional damage to the electronic communications infrastructure (ECI), we must also consider situations in which damage has been deliberate, both with...
the intention of causing disruption to the ECI, and without that intention, through theft of infrastructure components.

**BACKGROUND**

The last 60 or so years have seen a dramatic increase in the use of electronic communications. In the 1950s and 1960s, the fixed-line telephone moved from being a luxury or business-only need to a commodity service. During the 1970s, private communications networks became commonplace as businesses around the world found greater efficiency and lower cost by moving away from public networks for their core business transactions.

The 1980s saw the advent of mobile telephony, with the now ubiquitous Global System for Mobile communications (GSM) and Third Generation (3G) systems being increasingly available at decreasing cost. By the end of 2011, 87% of the world’s population (5.9 billion subscribers) were connected, and an estimated eight trillion text messages were sent in 2011 (mobiThinking, 2012). Many of these subscribers also use mobile networks to access the Internet from so-called ‘Smart phones’, with mobile web access accounting for more than 8% of worldwide web hits.

The explosion of the Internet in the 1990s, which had its beginnings at the ArpaNet in the USA in the 1970s, has now become a ‘must have’ for almost three billion users around the world (Neilsen Online, 2011).

Even in so-called ‘third world’ countries, the wide availability and low cost of the mobile and Internet services means that there will soon be few locations on the planet where electronic communication of some kind is not possible. This of course means that society’s dependencies on these methods of communication are increasing with the availability, and that when services cease to become available, day-to-day business is seriously disrupted.

With this increasing dependency on electronic communications, there is a corresponding increase in demand – especially from the business community – for high availability of services, since the non-availability of communications means lost revenue and business opportunity. The Internet has now joined the fixed and mobile voice networks as part of national and international critical infrastructure, which is referred to hereafter as the Electronic Communications Infrastructure or ECI.

Communications Service Providers are the primary beneficiaries of revenue from the services they provide, so it is in their own interests to ensure their availability at all times, and consequently to invest time and money in the design of their networks in order to minimise congestion and downtime.

However as this chapter will show, despite the best efforts of CSPs, problems that occur outside their direct control are usually those that bring about widespread loss of service. Knowing this, CSPs have been encouraged to plan and prepare for many kinds of disruption, and not just those over which they have the ability to influence directly (ENISA, 2011).

**TYPES OF DISRUPTION**

The types of disruption that have a dramatic impact on the Electronic Communications Infrastructure (ECI) include the following.

**Severe Weather-Related Disruptions**

Mother nature provides us with a number of severe weather-related hazards, including snow and ice storms; extended periods of low or high temperature; heavy rain; storms, tornados, hurricanes; wildfires; flooding and drought. She also arranges (often more severe) geological hazards, including earthquakes; tsunamis; volcanic eruptions; landslips, landslides and subsidence.
Related Content

How the Nature of Exogenous Shocks and Crises Impact Company Performance?: The Effects of Industry Characteristics

Empathy and Mindfulness: Exploring the Possible Predictors of Authentic Leadership
[www.igi-global.com/chapter/empathy-and-mindfulness/198262?camid=4v1a](www.igi-global.com/chapter/empathy-and-mindfulness/198262?camid=4v1a)

Using Statistical Texture Analysis for Medical Image Tamper Proofing
[www.igi-global.com/chapter/using-statistical-texture-analysis-medical/45807?camid=4v1a](www.igi-global.com/chapter/using-statistical-texture-analysis-medical/45807?camid=4v1a)

Identity Assurance in Open Networks
[www.igi-global.com/chapter/identity-assurance-open-networks/63082?camid=4v1a](www.igi-global.com/chapter/identity-assurance-open-networks/63082?camid=4v1a)