

## AMATEUR RADIO FACT SHEET / DISCUSSION POINTS

### TOPIC: CYBERWARFARE – “Lights Out” by Ted Koppel

- Famous news anchorman Ted Koppel's book on United cyberwarfare Lights Out presented a somewhat rambling discussion of just how vulnerable the States is to cyberwarfare interfering with power generation and other aspects of modern life. SCADA computers managing important systems were presented as a specific risk.
- The list of cyber attacks world wide grows every day, with Europe beset with ransomware attacks in recent weeks.
- Stuxnet believed to be a US attack on uranium separating centrifuges in Natantz, June 2010, over 1000 centrifuges destroyed.
- Distributed nature of U.S. Power grid both a vulnerability (smaller units ill-prepared) and a protection (unable to cause massive failure without penetrating multiple producers).
- 2015 Office of Personnel Management hacked and approximately 20 million personnel records compromised, likely including sensitive background clearance information compromising American agents.
- January 2014 gigabytes of sensitive data taken from JPMorgan
- December 2015 Ukraine power grid cyberattack, first known success cyberattack on power grid, 3 energy distribution companies attacked, 30 substations switched off and 230,000 persons left without electricity for 1 to 6 hours. Attacks included the SCADA computers as discussed by Koppel.
- December 2016, a more elaborate attack also on the Ukrainian power system. New software dubbed “Crash Override”
- June 2007 FCC order requiring backup power of 8 hours on cell phone towers:  
Local exchange carriers (LECs), including incumbent LECs (ILECs) and competitive LECs (CLECs), and commercial mobile radio service (CMRS) providers must have an emergency backup power source for all assets that are normally powered from local AC commercial power, including those inside central offices, cell sites, remote switches and digital loop carrier system remote terminals. LECs and CMRS providers should maintain emergency backup power for a minimum of 24 hours for assets inside central offices and **eight hours for cell sites, remote switches and digital loop carrier system remote terminals that are normally powered from local AC commercial power.** LECs that meet the definition of a Class B company as set forth in Section 32.11(b)(2) of the Commission’s rules and non-nationwide CMRS providers with no more than 500,000 subscribers are exempt from this rule.<sup>1</sup>

#### FAMOUS BLACKOUTS (of any cause)

July 2012 India Blackout	620 million	30-31 Jul 2012
November 2014 Bangladesh	150 million	1 November 2014
2003 Northeast blackout, USA	55 million	14-15 August 2003
September 2016 Puerto Rico	3.5 million	Sept 21 2016

REF: [http://www.nerc.com/pa/CI/ESISAC/Documents/E-ISAC\\_SANS\\_Ukraine\\_DUC\\_18Mar2016.pdf](http://www.nerc.com/pa/CI/ESISAC/Documents/E-ISAC_SANS_Ukraine_DUC_18Mar2016.pdf)

<sup>1</sup> 47 C.F.R. § 12.2.