NEXT GENERATION CRITICAL INFRASTRUCTURE
SMART – SECURE - RESILIENT

Next Generation Emergency Communications Safety

Cybersecurity

An Unavoidable Imperative

Risk Mitigation

KARTHIK BALASUBRAMANIAN
President & CEO
karthikb@karthikconsulting.com
NEXT GENERATION EMERGENCY COMMUNICATIONS SAFETY
AN UNAVOIDABLE IMPERATIVE

EMERGENCY COMMUNICATIONS FOR CITIZEN SAFETY

• 911 System (ECC/PSAPs)
• Wireless Emergency Alerts System (WEA)
• Telecommunications Supply Chain (TSC)

NEXT GENERATION THREATS ARE PRESENT TODAY

• 911: Analog to Digital + IoT+
  Cloud/Internet
• WEA: 3/4G to 5G + Cloud/Internet
• TSC: Supply, Ownership,
  Hardware, Software, Services
NEXT-GENERATION TECHNOLOGY ADOPTION PRESENTS SUBSTANTIAL LEVELS OF THREAT

Today
- Analog
- Digital
- Internet (Global)
- IoT (Hundreds of Millions)
- Cloud
- Wireline + Fiber + 4G
- Programmable Radio
- Emerging AI, ML and NLP

Next Generation
- Hybrid
- Digital + Quantum
- Internet (Global + Country)
- IoT (Billions and Billions)
- Hybrid (Storm) Clouds
- Fiber + 4G + 5G + Satellite
- Ubiquitous Software Defined Radio’s
- Advanced AI, ML, NLP and Quantum
IN TRANSITION – THE HYBRID ECC / PSAP
MOVING TO NEXT GENERATION ARCHITECTURE

EXPANSION OF THREAT SURFACE
WITH ANALOG VOICE + INTERNET
VOIP + IOT

- Analog Voice ECC / PSAP has vulnerabilities
- VoIP with internet access with evolving media significantly increases risk mitigation challenge
A GEOMETRICALLY EXPANDING THREAT SURFACE
IS THE ECC IMPLEMENTATION ARCHITECTURE FUTURE-THREAT PROOF?

RISK MITIGATION FOR CITIZEN SAFETY IS NON-TRIVIAL

- The integrated threat for NG911 + WEA + TSC is real
- Receiving high-integrity actionable communication from a multitude of technologies and communication channels is non-trivial
FUTURE RESEARCH REQUIRES AN AGGRESSIVE AGENDA
A RUNNING START

Understanding the complex vectors of a simultaneous, integrated, multi-faceted 911 + EMA + TSC attack

The role of a cross-system-wide architecture in Risk Mitigation of interconnected, interdependent Emergency Communication Systems Cyber Resilience

The Stormy Cloud Threat – Understanding and mitigating risk from global internet clouds that power a multi-channel multi-model communication threat to ECC / PSAPs

A lot more to be done...
THANK YOU

SCITECH.DHS.GOV | CIRI.ILLINOIS.EDU
KARTHIKCONSULTING.COM

KARTHK BALASUBRAMANIAN

KARTHIKB@KARTHIKCONSULTING.COM