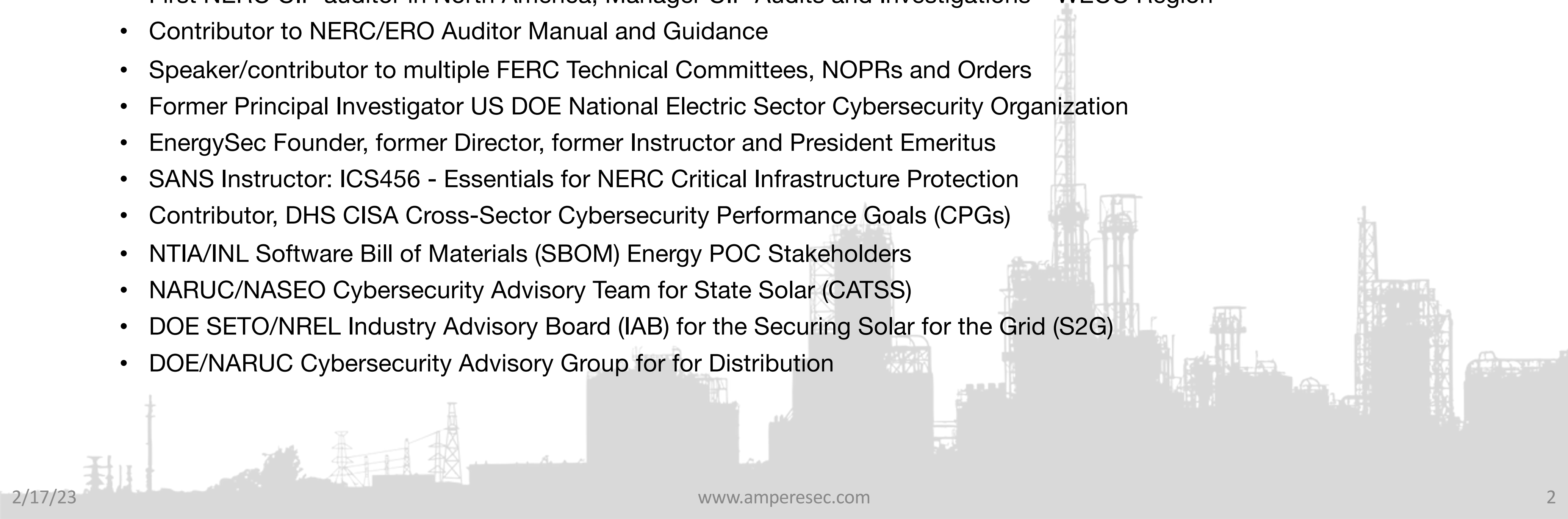
AMPERE

FERC Order 887 on Internal Network Security Monitoring (INSM)

WICF CIP Focus Group
February 14 2023

Introduction

- CEO, Owner, Ampere Industrial Security
- Former utility staff (telecommunications, water & electric)
- Drafter of NERC CIP standards and formal interpretations, current SCWG and SITES contributor
- First NERC CIP auditor in North America; Manager CIP Audits and Investigations – WECC Region
- Contributor to NERC/ERO Auditor Manual and Guidance
- Speaker/contributor to multiple FERC Technical Committees, NOPRs and Orders
- Former Principal Investigator US DOE National Electric Sector Cybersecurity Organization
- EnergySec Founder, former Director, former Instructor and President Emeritus
- SANS Instructor: ICS456 - Essentials for NERC Critical Infrastructure Protection
- Contributor, DHS CISA Cross-Sector Cybersecurity Performance Goals (CPGs)
- NTIA/INL Software Bill of Materials (SBOM) Energy POC Stakeholders
- NARUC/NASEO Cybersecurity Advisory Team for State Solar (CATSS)
- DOE SETO/NREL Industry Advisory Board (IAB) for the Securing Solar for the Grid (S2G)
- DOE/NARUC Cybersecurity Advisory Group for for Distribution



What happened?

- Jan 19, 2023 - FERC issued Order 887

- *…require internal network security monitoring (INSM) for CIP-networked environments for all high impact bulk electric system (BES) Cyber Systems with and without external routable connectivity and medium impact BES Cyber Systems with external routable connectivity…*

- *…NERC directed to submit a report "that studies the feasibility of implementing INSM at all low impact BES Cyber Systems and medium impact BES Cyber Systems without external routable connectivity." due within 12 months*

What is INSM?

- Internal = inside the ESP
- Network = essentially all “east-west” traffic for all Cyber Assets within the ESP
- Security = cybersecurity, generally speaking
- Monitoring = watching/alerting; implied recording/logging

- *…designed to address situations where vendors or individuals with authorized access are considered secure and trustworthy but could still introduce a cybersecurity risk to a high or medium impact BES Cyber System…*

Why now?

- FERC NOPR on INSM almost exactly a year before in 2022
- National Security Memorandum on Improving Cybersecurity for Critical Infrastructure Control Systems almost exactly a year before in 2021
- Several relevant Executive Orders issued in 2021 and 2022
- Conceptual mention in other regulation and para-regulatory (standards) requirements
- Considered good/common practice for ICS/OT cybersecurity
- Vendor controversy and speculation

What problem does this solve?

- If we already have perimeter controls and other controls inside the ESP on the individual Cyber Assets, where is the gap?
  - MANY controls in CIP-004, 005, 007, and 010
  - Granting/revoking access controls, account review, ESP, IRA, baselines, patching, anti-malware, CVAs, logging, monitoring, change control, TCAs, RMs
- FERC says… it is designed to address situations “where vendors or individuals with authorized access are considered secure and trustworthy but could still introduce a cybersecurity risk” to an applicable system

What problem does this solve?

- For example, in the event of a compromised ESP, FERC believes that improving visibility within a network with INSM would increase the probability of early detection of malicious activities and would allow for quicker mitigation and recovery from an attack
- Some other uses:
  - Illegitimate use of legitimate credentials (insider threat)
  - Abuse of allowed/legitimate commands, scripts and software
  - Detection of data exfiltration or network exploration
- Side effect of benefit to operational visibility as well

What will be in the new standard?

- FERC directed three security objectives
  - Network baseline
  - Monitoring and detecting unauthorized activity, connections, devices, and software inside the CIP-protected network
  - Identify anomalous activity to a high level of confidence by:
    1. logging network traffic (FERC notes that packet capture is one means of accomplishing this goal);
    2. maintaining logs and other data collected regarding network traffic; and
    3. implementing measures to minimize the likelihood of an attacker removing evidence of their tactics, techniques, and procedures from compromised devices.
- Expect new terms for the glossary, possibly…

Areas of interest for the SDT

- What level of detail in the network baseline?
  - Which systems are talking to which systems, or
  - The above, as well as port, protocol, time of day, frequency, etc…?
- What constitutes unauthorized “activity” and “connections”
  - …in a way that can be audited?
- For logging network traffic, what will be allowed in lieu of packet captures?
- How much of this data will need to be stored or for how long?
- Exactly which logs and other data will need to be collected and “maintained” regarding network traffic?
- Which log integrity methods will be expected?

When will it be effective?

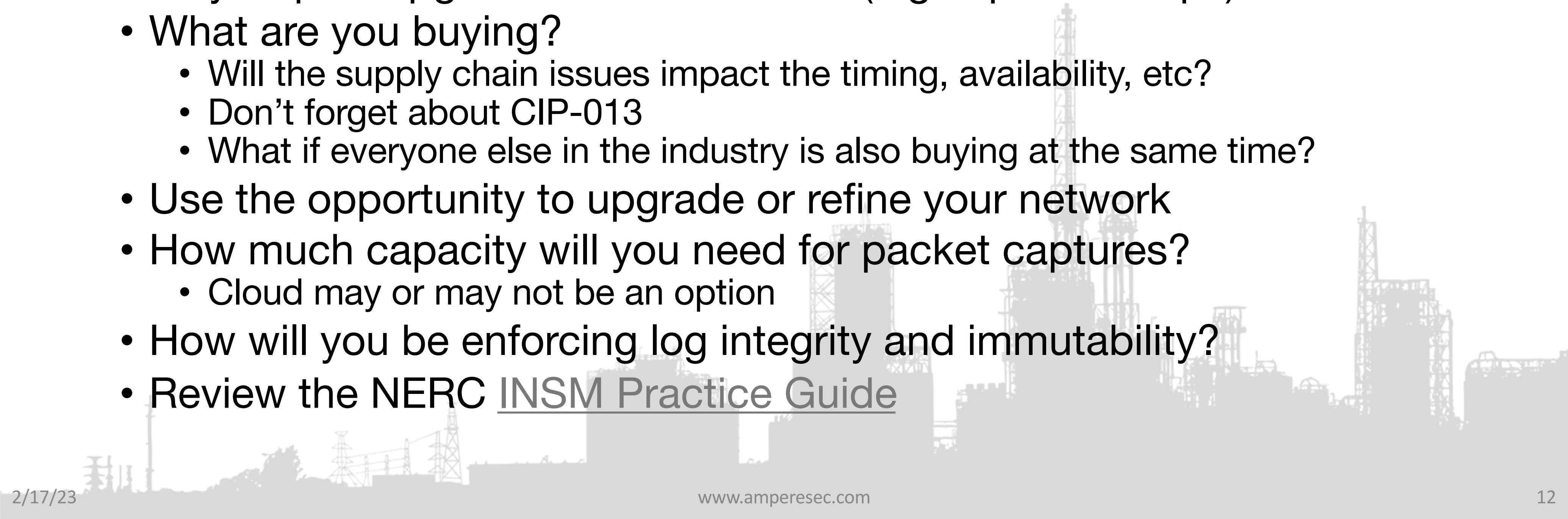
- 15-month directive for submittal of new standard to FERC
  - Probably early Q2 of 2024
- FERC will review and respond
  - Speculation that it will take 4-6 months
  - Could be Q4 of 2024 (or later)
- Assuming approval, likely 12-18 month implementation window
  - Q1-Q3 of 2026 speculated target for auditability
- Caveat: it could be slower or it could even be faster if we have a “catalytic event”

What’s next for NERC?

- Issue the SAR, form the SDT and get to work
  - The SDT will need the right people… is that you?
- Begin working on the medium without ERC and low impact study
  - The study will need to be credible… want to help?
  - Provide study to FERC for review
- Some working groups may produce guidance in tandem with, or even get ahead of the SDT

What are the next steps for you?

- Start planning now; this will take more time than you expect
  - Will any network outages be needed?
- May require upgrades to the network (e.g.: spans or taps)
- What are you buying?
  - Will the supply chain issues impact the timing, availability, etc?
  - Don’t forget about CIP-013
  - What if everyone else in the industry is also buying at the same time?
- Use the opportunity to upgrade or refine your network
- How much capacity will you need for packet captures?
  - Cloud may or may not be an option
- How will you be enforcing log integrity and immutability?
- Review the NERC INSM Practice Guide



Questions?

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