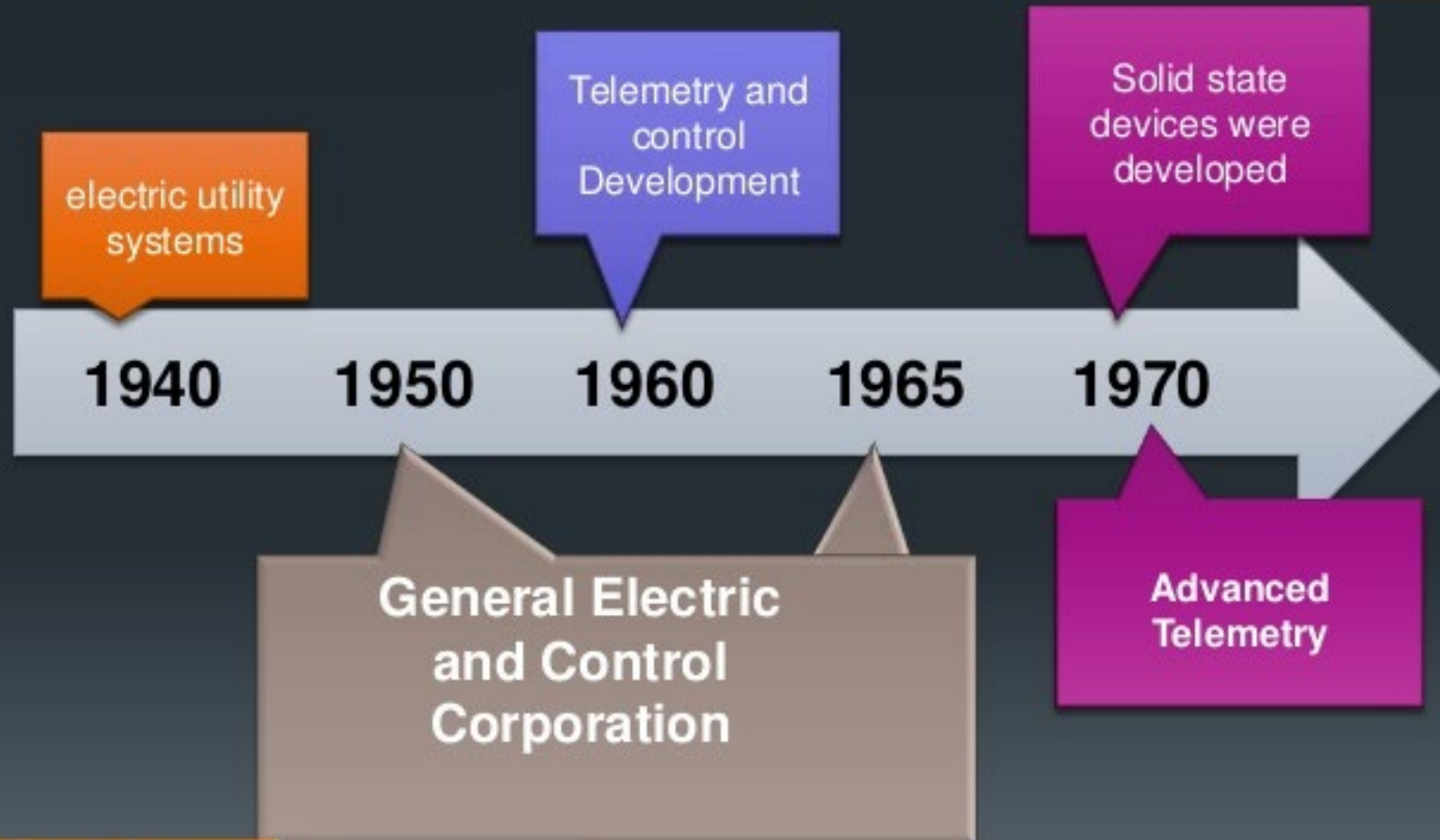


History of SCADA





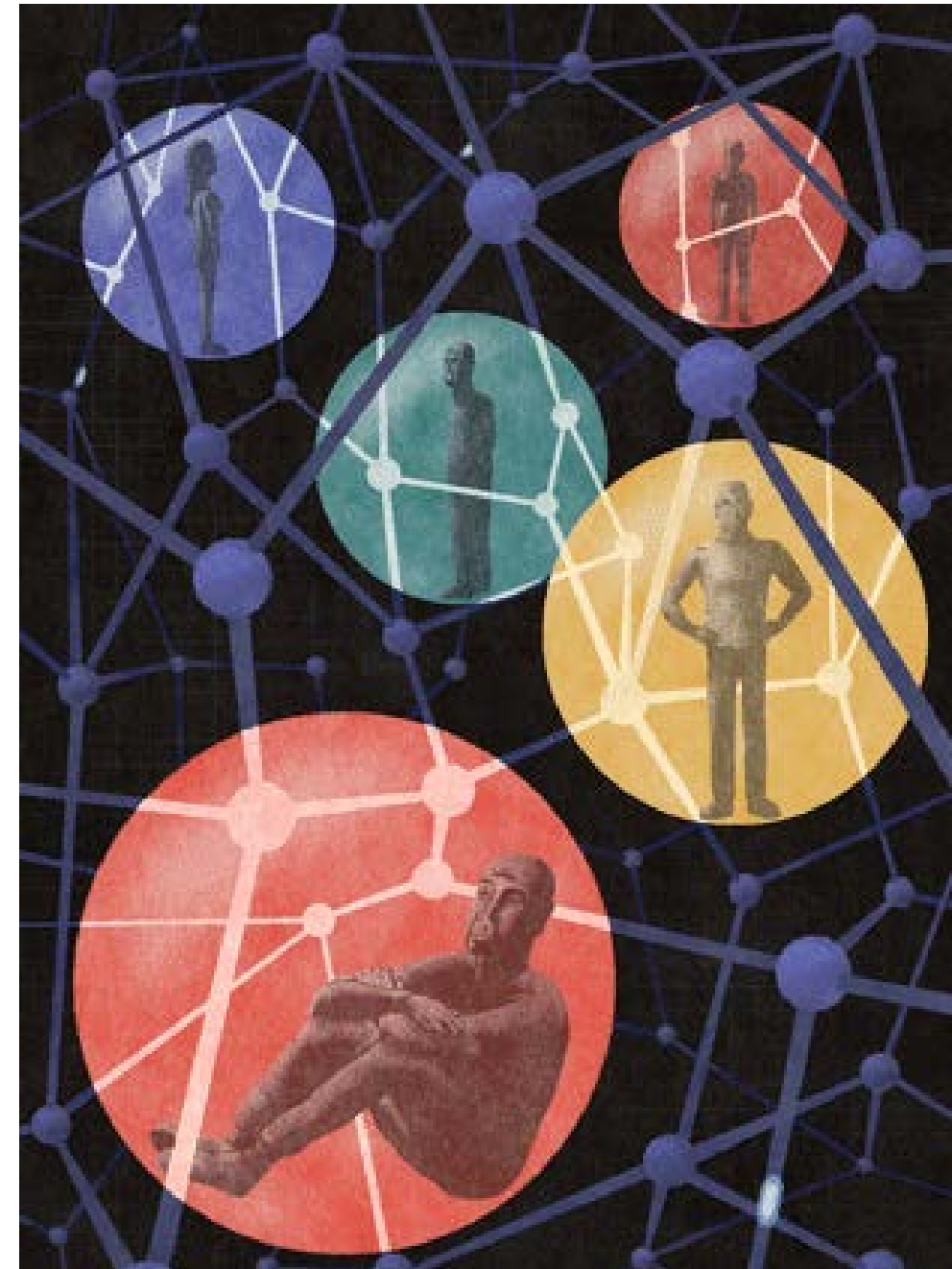
HACKED

CYBERATTACK

information protection

Challenges

- 4 distinct SCADA systems
 - OS
 - Architecture
 - Vendors
 - Requirements
 - Protocols
 - Regulatory bodies
- SCADA systems had very little collaboration with IT
- Differences in IT and OT mindsets
 - Rip & Replace vs. Maintain/Migrate/Modernize
 - 5 to 7 year life cycle vs. 20 to 50 year life cycle
 - Cutting Edge vs. Legacy Equipment
 - Data/Information Preservation vs. Manufacture and/or Delivery of Product
 - Downtime tolerance
- Workforce Culture regarding Cybersecurity



Challenges—Solutions

2013 – Data Communications Standards Group created to begin the process of aligning IT, Elec, Water, Gas, & Wastewater goals, standards, and processes

- Began integration on common radio system and fiber ring
- Added OT networks to the Cybersecurity Assessments already being conducted on the IT network
- Began specifying equipment together
- Started the process of standardizing documentation
- Began to share best practices between IT & OT groups for cybersecurity

2014 – Cybersecurity Task Force created to address cybersecurity company wide

- Representatives from stakeholders in finance, OT, IT, risk management, HR
- Began creating policy documents and training standards for all employees
- Created response plan for cyber events
- Initiated “table top” exercises to provide training for all workgroups

Future Technologies/Integrations

- SIEM for OT?
 - Security Information and Event Management (SCADA for IT network events)
 - Correlate Utility SCADA events with IT/OT Network events
- Cloud Computing
 - Utilities have been reluctant
 - Big Data will drive this
- Artificial Intelligence/Machine Learning
 - Real time comparison/corrections of mathematical models
 - Machine learned restoration of services
 - Comparison between GIS models and realtime data
- Control Room Dashboards
 - Realtime data for cyber events

John L. Powell, PE
Substations and Controls
Engineer
Greenville Utilities Commission
801 Mumford Road, Greenville,
NC, 27834
252-551-3388
powelljl@guc.com
www.guc.com