Resilience

- Fault Tolerance
- Disaster Tolerance
- People
Resilience – Fault Tolerance

- Design systems to actively recover from a failure with no / minimal interruption to service:
  - Identify critical resources
  - N+1 configurations or greater
  - Clustering Technologies
  - Local fail-over documented, tested
  - Virtualization
  - Redundant paths (network, power, infrastructure)
Design systems to support a return to operations (RTO) within a specific timeframe.

- Remote fail-over capabilities
- Vendor relationships
- Exercise:
  - Disaster Recovery Plan (and UPDATE it)
  - Alternative / Manual Process
Resilience – More

- Remember to focus on things besides Technology:
  - People (physical attack, pandemic, etc.)
  - Facilities (loss of data center, key resource, etc.)
  - Infrastructure (roadways, cell-service, Internet)
Quick Focus on People

- Develop a culture of SAFETY
  - Corrective Action Program
  - Active Safety Education & Awareness

- Document your processes
  - Include this action with employee reviews

- Know you can staff critical roles
Identify your critical assets
Incorporate security controls (huge)
  ◦ administrative
  ◦ technical
  ◦ physical
Protecting Critical Assets

- Security Control Overview
  - Inventory
  - Patch Program
  - SIEM – monitor, monitor, alert
  - Incident Response Plan
  - Vulnerability / Risk Management Plan
  - Culture of Security Awareness
    - AND improved behavior
Relationships

- Vendor Partners
  - Know your vendors
  - Who to call
  - What service to expect (timelines)
  - Have a backup
Utilities

- Good working relationships within organizations such as:
  - LPPC
  - APPA
  - RMEL
  - EPRI

- Why?
  - Consistency
  - Best practices
  - Awareness
**Relationships**

- **Government**
  - DHS, FERC (NERC), FBI, PUC

- **Why?**
  - Cybersecurity Awareness (DHS AIS)
  - Regulatory Compliance (NERC)
  - Information Sharing / Reporting (ALL)
Customers

- Be of service to the community
- Be present (events, parades, etc.)
- Be an asset to the community

- Be the source for problem resolution
  - All calls are important
  - All outages must be minimized

- Be the best stewards of rate payer dollars
Relationships

- Customers
  - Instill confidence, promote community culture
    - Green Energy
      - Solar
      - Wind
      - BioMass
Customers
  ◦ Always deliver the best possible service
    • System Average Interruption Frequency Index
      • SAIFI: 0.61 (average # of interruptions)
      • Average service interruption frequency of 5 minutes or more per customer during a 12-month period
    • System Average Interruption Duration Index
      • SAIDI: 50.21 (average # of minutes)
      • Average service interruption duration per customer on the electric system during a 12-month period
UT Energy Week

- Thanks