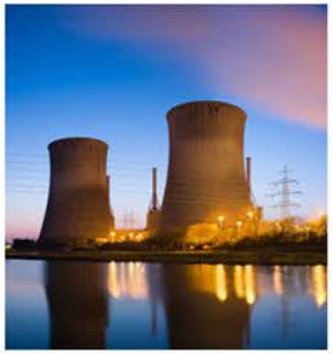
NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

Questionnaire Results

Reliability Issues Steering Committee

March 11, 2016

RELIABILITY | ACCOUNTABILITY

Question 1

- Are there risks to the BES reliability that aren't covered within these 14 risks? If so, what additional risk(s) should be added?
  - Shortage of skilled workers/aging workforce/loss of knowledge (2)
  - Natural gas dependency/pipeline resiliency
  - Cost swing impacts
  - Telecommunications dependency/Disruption of voice and data services (2)
  - Inaccurate EMS models
  - Aging infrastructure: *e.g.,* electro mechanical relays, relicensed nuclear plants, old coal plants that lead to reduced reliability
  - Reduction in declared or capable blackstart resources
  - Cybersecurity Supply Chain
  - Insider threat

Question 2

- Are the 14 risks mapped into the proper grouping? If not, what changes would you make? (consolidate groups, move risks to another group, add new group, etc.)
  - Combine Inadequate Human Performance and Inadequate Event Response and Recovery
  - Delete Pandemic
  - Human Performance can contribute to Generator Unavailability, Inadequate Maintenance/Asset Management, Single Points of Failures, Loss of EMS, Cyber, and Inadequate Event Response or Recovery
  - Generator Unavailability can be caused by Changing Resource Mix or Inadequate Maintenance
  - Regulatory Uncertainty has a strong relationship to Changing Resource Mix and Planning and Asset Management
  - Recovery/restoration could be grouped under Resiliency (2)
  - System Assets, Human Role, and Recovery Restoration are parts of Situational Awareness

Question 3

- What do you feel are the top three to five risks that need the industry's attention? The risks can be other than the 14 high-level risks listed by the RISC or any subpart of the 14 high-level risks.
  - #1 – Regulatory Uncertainty (6)
    - Investment recovery
  - #2A – Changing Resource Mix (10)
    - Increased renewable, intermittency, developing duck curve, ramping, reserves, frequency, backstop, capacity markets, ancillary services
  - #2B – Inadequate Planning Coordination (2)
  - #4A – Cyber Security (9)
  - #4C – Extreme Physical Man-made Events
  - #5 – Inadequate Human Performance

Question 3 continued

- What do you feel are the top three to five risks that need the industry's attention? The risks can be other than the 14 high-level risks listed by the RISC or any subpart of the 14 high-level risks.
  - Inadequate planning in the coordination of the power electronics; wind controllers, HVDC, STATCOM/SVC, PSS, G&T, protection schemes, storage controls, other FACT devices installed to maximize utilization of existing transmission system
  - Inadequate planning under FERC Order 1000
  - Inadequate regional/interconnection coordinated planning involving all producers and users
  - Aging infrastructure
  - Not managing system inertia
  - Dispersed and distributed resources
  - Gas/Electric coordination
  - "Complacency" in situational awareness

Question 4

- What do you feel are the lowest priority risks?
  - #1 – Regulatory Uncertainty (2)
  - #2B – Inadequate Planning Coordination
  - #2C – Ineffective Resource Planning
  - #3A – Inadequate Maintenance/Asset Maintenance (3)
  - #3C – Loss of EMS Situational Awareness
  - #4B – Extreme Physical Natural Events (3)
  - #4C – Extreme Physical Man-made Events (3)
  - #4D – Pandemic (8)
  - #6 – Inadequate Event Response or Recovery (5)

Question 5

- Does the **"Detailed Reliability Risk Description"** within each risk profile properly articulate the challenges? Which ones need to be modified? What is missing or misleading?
  - Broaden Inadequate Human Performance to cover future workforce availability/shortage.
  - Need better understanding of market issues
  - Regulatory Uncertainty should include siting difficulties
  - Inadequate Human Performance should address the lack of management of non-operational responsibilities being placed on operators
  - Inadequate Event Response or Recovery should address weather events and the need for mutual aid/assistance agreements
  - Third party energy efficiency and load management programs (security companies) risks for cyber and load curtailment
  - Need to mention operational/real-time risk: *e.g.,* dynamic state estimation and accurate real time models
  - Language and tone modifications

Questions and Answers