

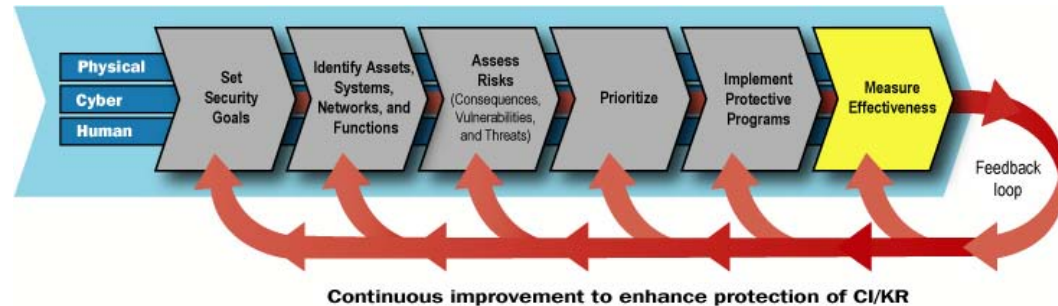
Energy Sector Metrics Pilot Study

Prepared for

*North American Electric Reliability Corporation
Reliability Metrics Working Group Meeting*

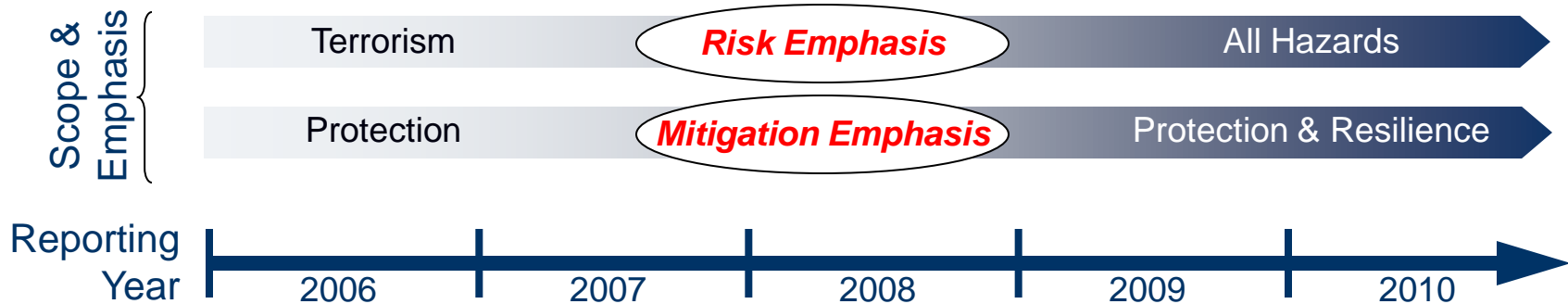
May 18, 2010

Background



- Work conducted by DHS Measurement and Reporting Office in collaboration with the Department of Energy
- Driven by the National Infrastructure Protection Plan (NIPP)
 - Risk Management Framework
 - Metrics and reporting requirements
- Quantitatively measure the status, progress, and effectiveness of Critical Infrastructure and Key Resources (CIKR) protection and resilience efforts at:
 - Sector level (e.g., meeting sector goals and objectives)
 - National level (e.g., DHS and other CIKR protection and resilience efforts)

Objectives of the Pilot Study



The study:

- Will develop a framework for evaluating resilience
- Be based on a common definition of resilience
- Identify issues in applying the approach to other sectors

The overarching purpose of the pilot study is to provide insight into measuring and evaluating the status of protection and resilience efforts within the electric industry.

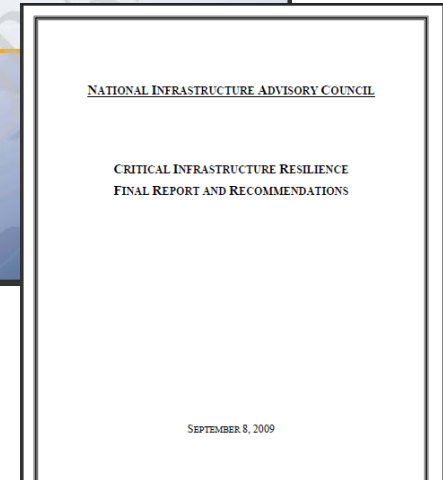
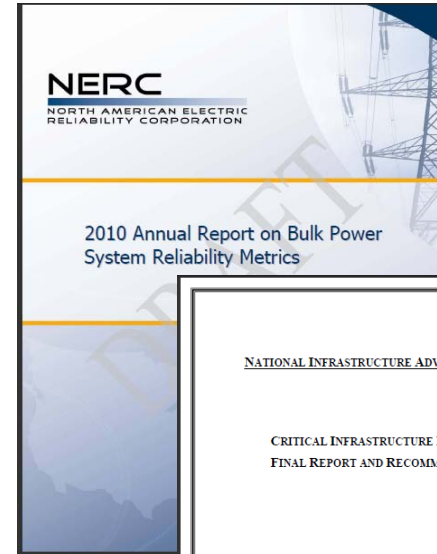
National Infrastructure Advisory Council (NIAC): Basic Definitions

- ***Infrastructure resilience*** is the ability to reduce the magnitude and/or duration of disruptive events. The effectiveness of a resilient infrastructure or enterprise depends upon its ability to anticipate, absorb, adapt to, and/or rapidly recover from a potentially disruptive event.
- **Characteristics of a resilient infrastructure:**
 - ***Robustness***: the ability to maintain critical operations and functions in the face of crisis
 - ***Resourcefulness***: the ability to skillfully prepare for, respond to, and manage a crisis or disruption as it unfolds
 - ***Rapid recovery***: the ability to return to and/or reconstitute normal operations as quickly and efficiently as possible after a disruption



Conceptual Approach

- Based on the NERC reliability standards and the NIAC definition of infrastructure resilience
- Identify linkages between reliability metrics and the NIAC characteristics of a resilient infrastructure
- Develop a Resilience Index using the ALR metrics information
- Collaborate/coordinate with NERC and other Energy Sector partners to ensure that the analysis and results are meaningful, reproducible, and defensible



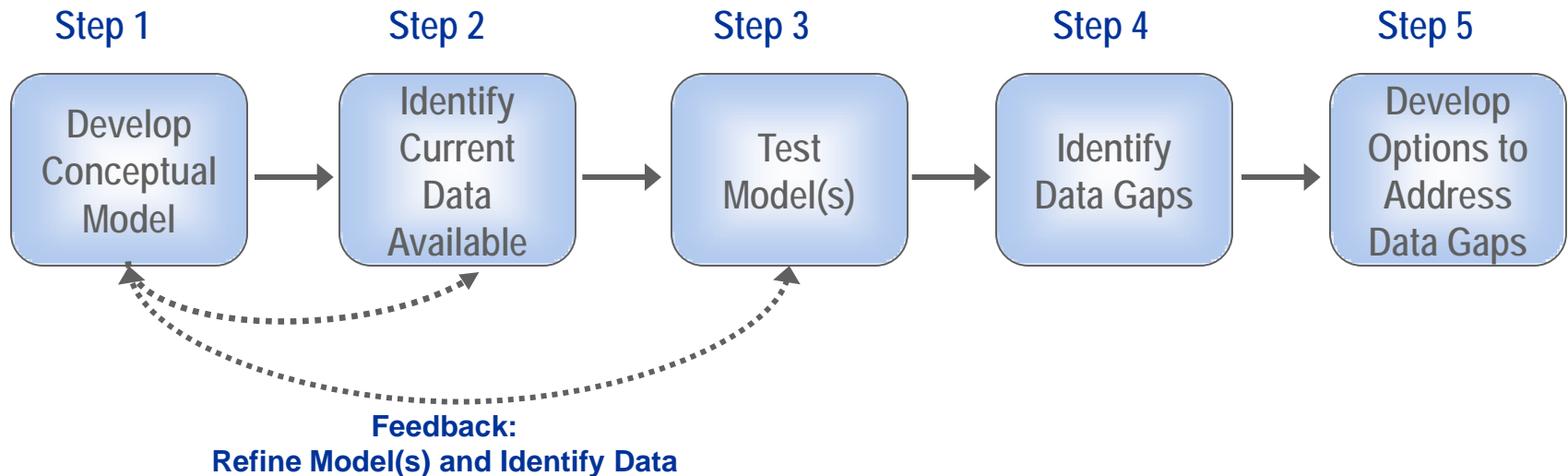
ALR 1-3	Planning Reserve Margin
ALR 1-4	BPS Transmission Related Events Resulting in Loss of Load
ALR 2-4	Average Percent Non-Recovery of Disturbance Control Standard (DCS) Events
ALR 2-5	Disturbance Control Events Greater than Most Severe Single Contingency (MSSC)
ALR 4-1	Percent of Automatic Transmission Outages caused by Failed Protection System Equipment
ALR 6-2	Energy Emergency Alert 3 (EEA3)
ALR 6-3	Energy Emergency Alert 2 (EEA2)

Linkage between ALR Metrics and NIAC Characteristics

Metric High Impact Medium Impact Low Impact	Robustness	Resourcefulness	Rapid Recovery
Planning Reserve Margin	High Impact		
BPS Transmission Related Events Resulting in Loss of Load	High Impact		
Average Percent Non-Recovery of Disturbance Control Standard (DCS) Events			High Impact
Disturbance Control Events Greater than Most Severe Single Contingency (MSSC)	Low Impact	Low Impact	
Percent of Automatic Transmission Outages caused by Failed Protection System Equipment	Medium Impact	Low Impact	
Energy Emergency Alert 3 (EEA3)	High Impact	Low Impact	
Energy Emergency Alert 2 (EEA2)	High Impact		



Next Steps



- **Collaborate with NERC staff to develop a conceptual model – considering DHS and NERC needs**
- **Possible approach for the conceptual model is to develop an index similar to the Severity Index**