Reliability Assessments Planning and Review Process

John Moura, Director of Reliability Assessment and System Analysis
Member Representatives Committee Meeting
August 10, 2016
## Core Reliability Assessment Program

<table>
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<tr>
<th>Assessment</th>
<th>Scope</th>
<th>Periodicity</th>
<th>Technical Committee Review</th>
<th>MRC/BOT Review</th>
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| **Long-Term**           | • 10-Year resource assessment  
                          • 5-Year probabilistic assessment                          | Annual (Probabilistic assessment conducted biennially) | Sept-Oct                  | Nov-Dec        |
| **Summer**              | • Resource assessment  
                          • Seasonal issues                                        | Annual                                          | May                        | N/A            |
| **Winter**              | • Resource assessment  
                          • Seasonal issues                                        | Annual                                          | Nov                        | N/A            |
| **Special (short and long-term)** | • Topic-focused  
                          • Emerging issues that require more assessment           | As Needed                                       | 2-4 weeks for comment and review; 1 week for endorsement | 2 weeks for comment, review, and acceptance |
• **2016 Long-Term Reliability Assessment (LTRA)**
  - MRC review – November
  - Board of Trustees (Board) acceptance and publish – December

• **2016/17 Winter Reliability Assessment**
  - Operating Committee (OC)/Planning Committee (PC) review and acceptance – October through November
  - Publish – November
• Distributed Energy Resources Task Force Final Report
  ▪ OC/PC review – September through December
  ▪ MRC review – January 2017
  ▪ Board acceptance and publish – February 2017

• Special Reliability Assessment
  ▪ Topic selected: *Assessment of Single Points of Disruption*
  ▪ Targeting Q2 of 2017 for Board acceptance
Questions and Answers
• Formed in December 2015
• Reports to the Essential Reliability Services Work Group
• Membership: Representatives from
  ▪ Transmission planning and operations
  ▪ Renewable developers
  ▪ Regulatory organizations
  ▪ Distribution utility
  ▪ Researchers
• Final report – To NERC Technical Committees in December 2016
  ▪ Identify current state
  ▪ Recommendations to plan the bulk power system for reliable operations
• Operational impacts in areas with high penetration of distributed energy resources
• Recommendation for consistent modeling and assessing DER
• Review existing NERC Reliability Standards and coordinate with IEEE 1547 standard related efforts
• Review the NERC Functional Model, registration categories
• Evaluate the need for Reliability Guidelines and/or Standard Authorization Requests (SAR)
• How should DER be included in planning and operating models?
• What level of control is needed for reliable system operations?
• What level of visibility do system operators require?
• How can DER characteristics contribute to or impact the reliability of the bulk power system?
  ▪ More than load modifiers
  ▪ Impacts dynamic character of the power system
• What does the ERO need to consider?
MRC Input Letter Response
NERC DER Workshop Update
August 2-3, 2016
Atlanta GA
Questions and Answers
• Consolidates and integrates:
  - Strategic goals and their contributing activities for the next three years
  - Metrics
  - Longer-term strategic planning considerations
  - Reliability Issues Steering Committee’s (RISC’s) risk profiles
Policy input requested on:

- RISC’s 2016 proposed risk profiles
- ERO Enterprise longer-term strategic planning considerations
- ERO Enterprise strategic goals and contributing activities for 2016–2019, and whether they focus on the right priorities for 2017–2020
- Proposed ERO Enterprise results-based reliability metrics
RISC’s Proposed 2016 Risk Profiles

- Changing Resource Mix
- Bulk Power System Planning
- Resource Adequacy and Performance
- Asset Management and Maintenance
- Human Performance and Skilled Workforce
- Loss of Situational Awareness
- Extreme Natural Events
- Physical Security Vulnerabilities
- Cyber Security Vulnerabilities
• Reliability Assessment: Resource and Planning Adequacy
  ▪ Increase sophistication of reliability assessments to address emerging risks

• Recovery and Restoration
  ▪ Increase understanding of the impacts of recovery and restoration plans from changing grid characteristics

• Situational Awareness and System Control
  ▪ Assess and promote awareness of how the integration of new technologies with a changing grid impacts situational awareness and system control
• **Goal 1:** Timely and Risk Responsive Reliability Standards
• **Goal 2:** Objective and Risk-informed Compliance Monitoring, Enforcement, and Organization Certification and Registration
• **Goal 3:** Identification and Mitigation of Significant Reliability Risks
• **Goal 4:** Identification and Assessment of Emerging Risks
• **Goal 5:** Effective, Efficient, and Collaborative ERO Enterprise
1. Reliability Results
2. Assurance Effectiveness
3. Risk Mitigation Effectiveness
4. Essential Reliability Services
5. Resource Adequacy
6. Physical and Cyber Security
7. Controlling Reliability Risk through Compliance
• Adjusted annually for targeted risks

• Metric 3 sub-metrics:
  - Annual protection system misoperation rate
  - Automatic AC transmission outages caused by human error
  - Transmission line outages caused by breakers, transformers, and bushings
  - Transmission line outages from vegetation (≥ 200 kV above lines)
  - Events caused by generating unit forced outages due to cold weather
• 2017 Business Plan and Budget (BP&B) is mapped to the ERO Enterprise Strategic Plan 2016–2019
• Increased alignment in 2017 between the schedules for the 2018 BP&B and ERO Enterprise Strategic Plan 2018–2021
• **July and October 2016**
  - Policy input on strategic plan content

• **August 2016**
  - Board of Trustees (Board) strategic planning session
  - ERO Enterprise strategic planning session

• **November 2016**
  - ERO Enterprise Strategic Plan 2017–2020 to Board
  - Schedule for increased alignment between the 2018 BP&B and ERO Enterprise Strategic Plan 2018–2021
Questions and Answers
Update on Aliso Canyon

Jim Robb – Chief Executive Officer
Aliso Canyon – Reliability Assessment

• Resource Adequacy
  – Adequate generation across the Interconnection exists to cover potential Los Angeles Basin shortfalls under all but most extreme conditions

• Stability Assessment
  – Approximately 1300 MW of local generation required to provide local voltage support and stable system operations
  – Exact configuration of needed local generation will depend on Real-time operating conditions

Note: Analysis is focused narrowly on L.A. Basin resources and transmission in and out of the basin and did not assess the potential impact gas curtailment could have on availability of other Southern California resources, imports and transmission paths.
## Aliso Canyon – Enabling Actions

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<th>Actions</th>
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| **Aliso Canyon Gas Use**    | • CPUC/DOGGR authorized up to 10 BCF of gas from Aliso Canyon to be used to support electric reliability  
                              • None used to date                                                                                                                   |
| **Liquid Fuel Use**         | • SCAQMD issued a limited variance to LADWP to allow use of diesel in 12 LA Basin Units totaling 1300 MW  
                              • Under Emergency Energy Alert or Transmission Emergency (called by or validated by Peak Reliability)  
                              • Valid through September 13, 2016                                                                                                    |
| **Operational Coordination**| • Preparedness Summit (Peak/WECC/NERC)  
                              • Weekly planning calls and daily coordination calls  
                              • Re-dispatch of generation to mitigate gas curtailments  
                              • Limited need for Flex Alerts to date                                                                                               |
Aliso Canyon/Gas Outlook

• Aliso Canyon Wells
  – 1 permanently sealed
  – 15 passed all tests
  – 32 pending test results
  – 66 plugged and awaiting testing

• Broader Gas Infrastructure in the West
  – Discussing scope alternatives for a reliability and risk assessment associated with evolving fuel mix
Short Term Special Assessment: Single Point of Disruption on Natural Gas Infrastructure

John Moura, Director, Reliability Assessment and System Analysis
Member Representatives Committee Meeting
August 10, 2016
• Potential for large amounts of generation to be impacted by:
  ▪ Pipeline segment outages
  ▪ Disruption of Liquefied Natural Gas transport operations
  ▪ Natural gas storage disruptions

• Follow up analysis on Aliso Canyon outage through 2016 summer and 2016/17 winter seasons

• Recommendations for studies to evaluate single points of disruption and identification of mitigating measures
Timing and Development Approach

• Schedule
  ▪ **September** – full scope and report structure to be developed with the Reliability Assessment Subcommittee
  ▪ **September to March** – development of report with stakeholders
  ▪ **End of May** – Finalize with Board of Trustees and publish report

• Approach
  ▪ Identify broad, high-level, and multi-regional impacts
  ▪ Leverage key analysis developed by industry and national labs
  ▪ Protect critical infrastructure information and any detailed results
Questions and Answers
Recent FERC Activity

Michael Bardee
Director, Office of Electric Reliability
Federal Energy Regulatory Commission
August 10, 2016
Cybersecurity: Supply Chain

- Final Rule, Docket No. RM15-14, July 2016
- Directs NERC to develop new or modified reliability standard for supply chain risk management for industrial control system hardware, software and computing and networking services associated with BES operations
- Standard must require entities to develop a plan to meet four objectives:
  1. Software integrity and authenticity
  2. Vendor remote access
  3. Information system planning
  4. Vendor risk management and procurement controls
- Flexibility: standard addresses “what,” not “how”
Rehearing of Order No. 822

- Denial of Rehearing, Docket No. RM15-14, July 2016
- Order No. 822, issued January 2016, approved seven CIP Reliability Standards and directed NERC to develop additional modifications to the CIP Reliability Standards
- Foundation for Resilient Societies and Isologic LLC separately filed requests for rehearing
  - Requests:
    - Define “communication networks” to include substations
    - Modify Order No. 822 to include removal of malware from the system components of NERC-registered entities
    - Clarify that it is not the intent of the Commission to preclude complementary operational cybersecurity programs
- Cited NERC’s ongoing study of remote access and new NOI
Cyber Systems in Control Centers

- Notice of Inquiry, Docket No. RM16-18-000, July 2016
- Addresses need for modifications to CIP standards on protection of control centers used to monitor and control the BES
- Application whitelisting and isolation of certain control centers from Internet
- Comments due 60 days from publication in Federal Register
Ride-Through Requirements for Small Generators

- Final Rule, Docket No. RM16-8, July 2016
- Revises pro forma Small Generator Interconnection Agreement to match requirements for large generators on frequency and voltage ride-through
- Transmission provider determines settings consistent with Good Utility Practice and settings applied to comparable facilities
Reactive Power Requirements for Non-Synchronous Generation

• Final Rule, Docket No. RM16-1, June 2016
• New reactive power requirements for newly interconnecting non-synchronous generators
• Eliminates the exemption for wind generators from the requirement to provide reactive power
• Must provide dynamic reactive power, within 0.95 leading/lagging at high side of generator substation
• Did not change compensation policies
• Will take effect on September 21, 2016
FAST Act CEII Regulations

- Proposal to implement provisions of the Fixing America’s Surface Transportation Act (FAST Act) that require the designation, protection and sharing of critical energy/electric infrastructure information (CEII)
- Comments due August 19, 2016
Availability of Certain Databases

- Final Rule, Docket No. RM 15-25, June 2016
- TADS, GADS and MisOps databases
- Requires NERC to provide the Commission with access to NERC’s databases on a non-public and ongoing basis
- Applies only to data:
  - Regarding U.S. facilities
  - Required to be provided to NERC, not voluntary submissions
- To take effect upon issuance of FAST Act final rule
BAL-002-2 NOPR

- Docket No. RM 16-7, May 2016
- Comments closed July 25, 2016
- Proposal to approve BAL-002-2, Disturbance Control Standard—Contingency Reserve for Recovery from a Balancing Contingency Event Reliability Standard, proposed by NERC
- Also proposed three modifications