

Overview of NERC Integration of Variable Generation Task Force (IVGTF) Report

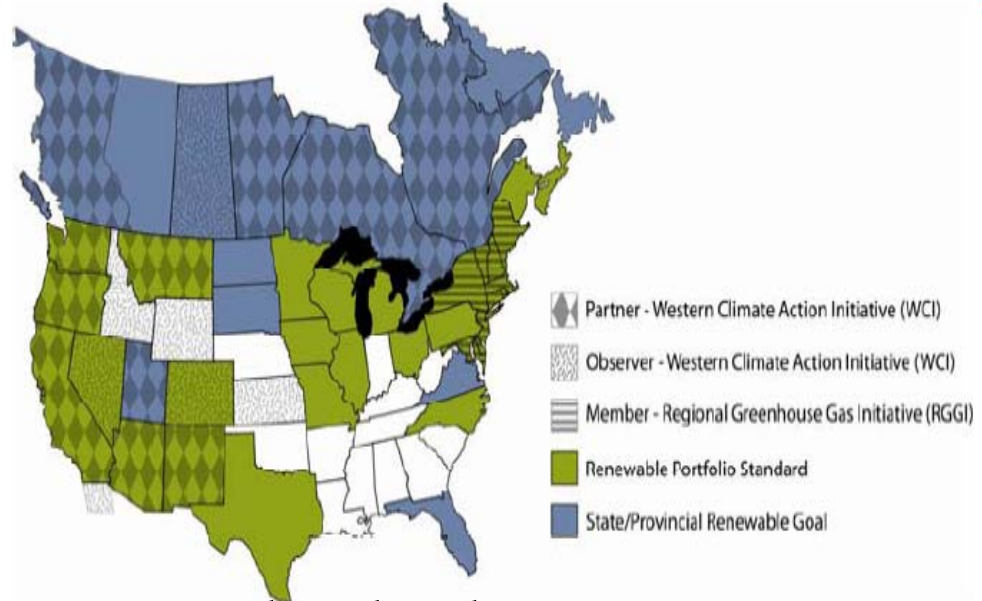
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SE-57/WPSC, June 16, 2009



- Considerable growth in variable renewable generation (wind, solar, small hydro & ocean) due to policy and regulations on greenhouse gas emissions
- Special Task Force: [NERC Integration of Variable Generation Task Force (IVGTF)] created in December 2007
- IVGTF tasked to prepare:
 - a white paper/report (philosophical and technical considerations for integrating variable resources into the Interconnection), and
 - recommendations for wind practices and requirements, including reliability standards that cover the planning, operations planning, and real-time operating timeframes
- Final Report/Recommendations (released in mid April 2009)

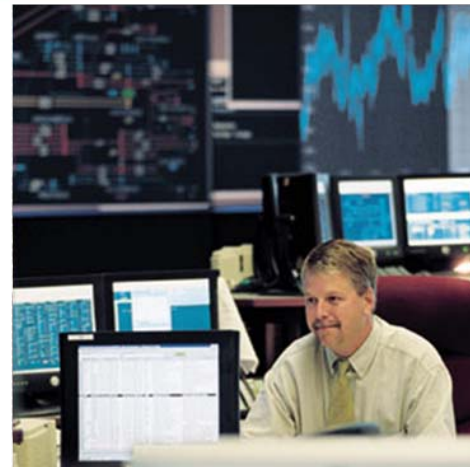
- NERC Report - Recommendations and Actions
 - NERC led action plans (eventually impacting industry)
 - Industry led actions
- Power system planners and operators need to develop:
 - enhanced planning and operational practices and methods
 - study and coordination efforts and
 - “resources”
- Report is just the beginning of efforts
- IESO as a ‘full member’ of NERC IVGTF remained actively involved in the development of this report



- Requirements of significant transmission additions and reinforcements
- Enhanced measurement and forecasting of variable generation output
- More comprehensive planning approaches, from the distribution system through to the bulk power system

- Deploying different types of variable resources (such as solar and wind generation)
- Advanced wind control technology
- Additional flexible resources, such as demand response, plug-in hybrid electric vehicles, and storage capacity, e.g. compressed air energy storage (CAES)
- Greater access to larger pools of available generation and demand

- IESO connection assessment & approval processes,
 - Ontario's LVRT performance validation using on-site testing of wind plants,
 - IESO's wind forecasting methodology
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- References and links for further reading:
 - IESO's smart grid report
 - IESO "Ontario Reliability Outlook"
 - IESO wind/WPSC activities/web pages



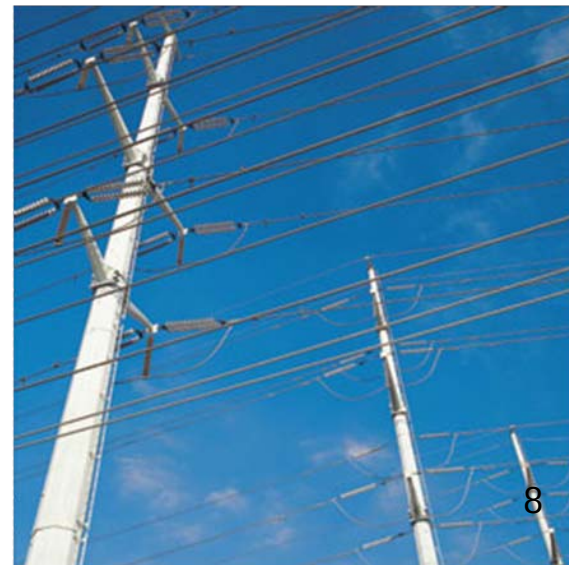
Examples of Specific Recommendations (NERC led actions)

- Forecasting techniques must be incorporated into day-to-day operational planning and real-time operations routines/practices including unit commitment and dispatch.
- Variable distributed resources can have a significant impact on system operation and must be considered and included in power system planning studies
- Operating practices, procedures and tools will need to be enhanced and modified



Examples of Specific Recommendations (Industry actions)

- Variable generation owner, operators and vendors must familiarize themselves with the intent and purpose of NERC's Standards
- The following industry research and development activities are needed:
 - Develop demand response and storage technologies.
 - Monitor the impact on reliability of distributed variable generators.
 - Improve forecasting methods, in particular, specific applications such as severe weather and next hour(s) ramping event forecasting.
 - Use of probabilistic planning techniques and the data needed to perform this analysis



- Implementation of IVGTF report's recommendations and follow-on activities/analysis via NERC groups, committees & sub-committees and industry participation
- NERC Reliability Standards may be updated/developed, where required
- Industry led recommendations and actions
 - Studies, analysis and coordination efforts will/should continue
- Planners and operators would benefit from a future "reference manual"

- A counter part IESO work plan is being developed re: NERC IVGTF recommendations
- IESO will accelerate its efforts re:
 - Green Electricity Act, 2009
 - IVGTF
- Opportunities exist to participate, study or enhance IESO/Ontario processes, where required
- IESO will continue to collaborate with Ontario participants and wind parties via Wind Power Standing Committee (WPSC), SE-57 and IESO Standards Development Program



- NERC IVGTF Special Report link:
http://www.nerc.com/files/IVGTF_Report_041609.pdf
- IESO WPSC web link:
http://www.ieso.ca/imoweb/consult/consult_windpower-sc.asp
- IESO SE-57 web link:
http://www.ieso.ca/imoweb/consult/consult_se57.asp

