

NERC

NORTH AMERICAN ELECTRIC
RELIABILITY CORPORATION

Annual Report 2008

to ensure
the reliability of the
bulk power system

May 2009

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North American Electric Reliability Corporation
2008 Profile

Founded: 1968

Incorporated: 2006

Business: 501(c)(6) not-for-profit organization

Serving: 400 million people

Employees: 95 and growing

Registered Entities: Approx. 1800

Regional Entities: 8

2008 Budget: \$34 million

Funding: Operating costs allocated to end-users
of electricity in the U.S. and Canada

Activities:

- Creates reliability standards
- Enforces compliance
- Monitors system status
- Analyzes system events
- Collects & provides data
- Forecasts future reliability
- Identifies trends & issues
- Certifies system operators

Headquarters

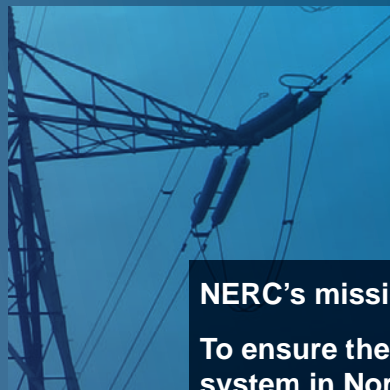
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NERC's mission is:

To ensure the reliability of the bulk power system in North America.

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president's report

2008 was a critical year in the growth of the electric reliability organization, adding clarity to NERC's role, responsibilities, and direction.

When trying to explain who NERC is and what we do in interviews, social settings, and meetings with leaders outside the industry, I am often asked: "how can an industry regulate itself? Isn't there a conflict of interest?"

"the bulk power system is only as strong as its weakest link"

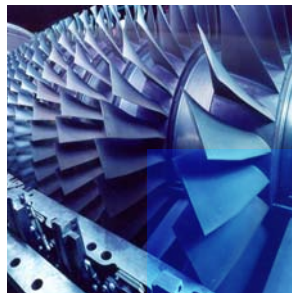
Energy and environmental policy pose similar challenges. While NERC is not, and

I answer them by explaining that the electric industry is different than others in that we are critically interconnected: the bulk power system is only as strong as its weakest link. Every asset owner has an interest in ensuring its neighbors keep reliability a priority - what happens on one system affects the next, and so on. Heads nod.

not the other way around. Put simply: if reliability problems persist, NERC will be asked why its standards and compliance actions weren't tougher.

has no interest in becoming a lobbying firm, we do believe it is critical that lawmakers understand and take account of reliability impacts as they develop policies that affect the electric grid. This is especially true for environmental legislation that seeks to significantly change North America's generation mix without removing barriers to transmission development. It is our responsibility to be the voice for reliability in the policy debate.

In short, I explain, we are in a unique position to make the self-regulatory model work. The incentives are in the right place, the experts are engaged. Mutual interest exceeds personal gain. I firmly believe this is the right model for ensuring the reliability of the bulk power system in North America, but we're still in the formative stages of this new effort. The opportunity for success is clear.



These heightened expectations necessarily inform our perspective on what it means to be a successful self-regulatory electric reliability organization. NERC must be effective, efficient, strong, and unquestionably an authority. At the same time, NERC must be a beacon for industry-driven technical excellence and collaboration.

Becoming the self-regulatory electric reliability organization for North America has thoroughly transformed NERC, how we operate, and what others expect of us. Perhaps the best illustration of this change occurred in 2008 as we faced increasing scrutiny on our response to cyber security. It quickly became clear that NERC was to be held accountable for its actions to protect the grid - and, fairly or unfairly by extension, the industry's actions as well. Policy makers expect NERC to oversee the industry,

NERC's rules of procedure set the bar high on all fronts - from standards to compliance to assessments.

Our rules specify that NERC standards are not to be a "lowest common denominator compromise," but rather are intended to seek, via a stakeholder driven process, the best approach for bulk power system reliability. Our rules specify the maintenance of an American National Standards Institute (ANSI) accredited process designed to ensure fairness, equal representation, and due process. It's my firm belief that strong standards come from the experts operating and planning the system every day.



Once a standard has been approved, our rules require NERC and the regional entities to faithfully enforce the standard. In this capacity, NERC must act as a regulatory authority with fully independent oversight of the industry. The authority to determine compliance actions rests ultimately with our Board of Trustees. Compliance is not an industry-driven process, yet to be successful it must encourage self-reporting and support the development of a strong compliance culture by users, owners, and operators.

Compliance has been an area of contention as this regulatory authority role has developed. The volume of initial violations has tested and strained the regional model, as NERC and the regions worked to process literally thousands of violations throughout the year. Improving this process will be an area of continual focus for NERC in the coming year.

It is also our responsibility to assess reliability performance, transmission and generation adequacy, and identify and study trends that may affect reliability. Our assessments are to be independent, but built from the bottom up. I am a firm believer that the best resource projections come from the industry that runs the system. NERC's committees play a vital role in keeping these assessments current and meaningful.

Committees in general are an important part of the ERO framework, providing the foundation for technical excellence and, ultimately, helping to get the job done. Our nearly 500 volunteers faithfully commit their time and energy to supporting reliability and share the weight of responsibility placed on the ERO in their roles.

The technical expertise of our committees, coupled with the versatility and responsiveness of a small organization like NERC, provides great potential for excellent work on a variety of emerging issues. In 2008, those ranged from the drought in the Southeast to demand response.

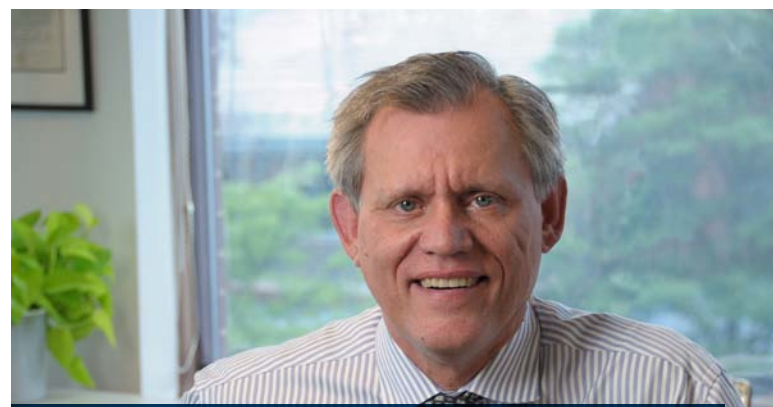
NERC's government partners also have an important role to play in the self-regulatory electric reliability organization model. Their participation is evident to those who have attended a committee or standards drafting team meeting over the past year. While there are necessarily limitations on their authority - technical directives in the standards development and alerts process come to mind - they provide an important, early perspective that ultimately adds value to our work.

Balancing the diverse interests of these stakeholder bodies, our complex role, and the host of issues confronting the organization leaves us gently walking along a tightrope in the pursuit of reliability. It's not always clear where the tightrope falls in optimizing the grid, and it often extends into uncharted territory. Our ability to carefully place our next step determines our success. At times, it takes an acrobat to pull off the show.

In February of 2009, NERC bid "adieu" to one of its most talented acrobats, our long-time chair Richard Drouin. His leadership will be missed and we wish him well in all his endeavors.

As we look to the future, we appreciate your patience, your guidance, your genuine desire to help us succeed. I'm speaking on behalf of our entire organization when I say we're looking forward to many reliable years to come.

Rick



Rick Sergel, President & CEO

Formerly President & CEO of National Grid USA and member of the board of State Street Corporation, Rick Sergel joined NERC in 2005.

standards

Through our industry consensus-based process, NERC develops strong, performance based standards designed to ensure the reliability of the bulk power system in North America.

About Standards

NERC's reliability standards program develops and maintains standards designed to ensure the reliability of the bulk power system in North America. NERC's ANSI-accredited standards development process is open, balanced, and transparent, relying on industry subject matter experts to scope, draft, and ultimately approve the standards for adoption by NERC's Board of Trustees and filing with regulatory authorities in the U.S. and Canada.

NERC staff coordinators facilitate standards drafting team activities, ensuring the drafting teams adhere to the integrity of the development process and that the quality of documents produced are appropriate for approval. Each standard must be technically excellent, timely, just, reasonable, not unduly discriminatory or preferential, in the public interest, and consistent with other applicable standards or government authorities in order to be approved.

The standards committee provides additional oversight, verifying that the standards development process has been adequately executed. The committee is also responsible for development and implementation of the three-year Reliability Standards Development Plan used to guide standard development activities.

2008: A Year In Review

NERC continues to review and improve existing standards and begin drafting proposed new standards in a number of key areas. This effort included nearly 90 standards in 2008 as work continued on violation severity levels, violation risk factors, interpretation requests, and developing new and updated standards. Over 50 of these standards were approved by NERC's Board of Trustees last year.

Two sets of pivotal NERC standards adopted in 2008 address issues from the August 2003 Northeast blackout. Relay Loadability (PRC-023-1) addresses the expected settings of load sensing relays to ensure they do not undesirably operate during a system event. Through focused industry efforts, events involving

relays of this type have significantly decreased since the blackout and this standard will ensure continual emphasis on this issue.

In late 2008, the electric industry approved revised standards for operating personnel training that require the use of a systematic approach to training, a more rigorous and structured framework for developing and delivering operator training. The standards were approved by NERC's Board in early 2009.

Perhaps the highest profile standards project in 2008 was Cyber Security Order 706, modifying NERC's Critical Infrastructure Protection standards. In their conditional approval in January, FERC required an expedited review of the standards to address several weaknesses identified in the order. As a result, NERC's Cyber Security Order 706 drafting team developed a multi-phase approach and produced a first set of modifications for industry comment in only 45 days. As this project continues into 2009, its progress will be closely monitored by members of Congress and intelligence organizations.

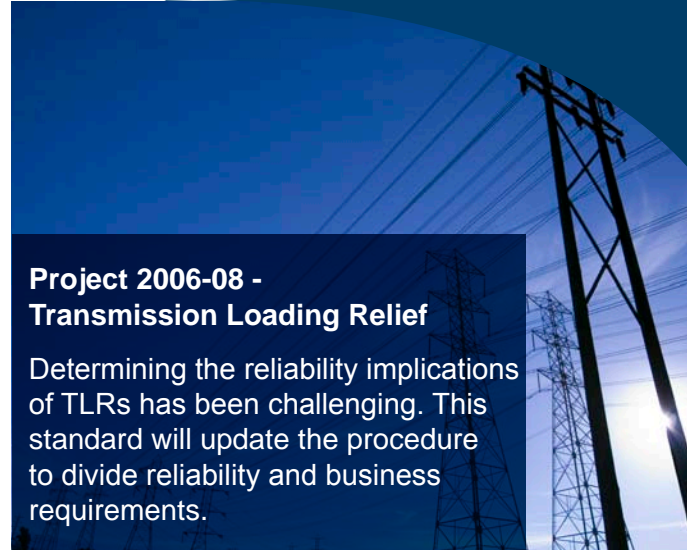
Modifications to NERC's system modeling standards pertaining to Available Transfer Capability was another key project in 2008, addressing another top priority. The board adoption of five modeling standards in August and a sixth in November is a testament to the effectiveness of this industry process.

The successful development of violation severity levels for the original 83 FERC-approved NERC standards is another of NERC's accomplishments in 2008. Violation severity levels address how non-compliant an entity is with a specific requirement.



Project 2007-23 - Violation Severity Levels

Violation severity levels define the degrees to which a standard is violated, allowing compliance enforcement to assess appropriate penalties when violations occur.



Project 2006-08 - Transmission Loading Relief

Determining the reliability implications of TLRs has been challenging. This standard will update the procedure to divide reliability and business requirements.



2007-12 - Frequency Response

Generator frequency response has steadily declined over the past decade. This standard will allow NERC to better evaluate this emerging potential reliability issue.




Keeping the Lights On

NERC handled 83 reliability standards in 2008, improving existing standards and developing others.



PRC-023-01 - Relay Loadability

Relay loadability was a major factor in the August 2003 blackout. Approved by NERC's Board of Trustees in January 2008, the standard is awaiting approval by FERC in the U.S.



Project 2007-07 - Vegetation Management

Vegetation management continues to be a key focus for reliability. This project will strengthen the existing standard FAC-003-01.



Project 2008-06 - Cyber Security Standards

In 2008, NERC began a comprehensive review and improvement of its critical infrastructure protection standards. This represents a major milestone in the effort to secure the grid from cyber attack.

enforcement

NERC ensures compliance with reliability standards through its fully-independent compliance monitoring and enforcement arm.

About Compliance Monitoring and Enforcement

NERC's compliance monitoring and enforcement program is an independent arm of NERC that fairly and consistently enforces compliance with NERC standards throughout North America. Subject to oversight by the Federal Energy Regulatory Commission in the United States and governmental authorities in Canada, the compliance program acts as an international enforcement organization for reliability standards.

NERC's first priority in compliance monitoring and enforcement is addressing critical reliability issues at hand. NERC and the regional entities work closely with each user, owner, or operator to review and monitor plans to resolve any deficiencies with adherence to reliability standards as quickly as possible.

NERC conducts its compliance monitoring and enforcement activities via a number of methods, including regular and scheduled compliance audits, random spot checks, and specific investigations as warranted by indications that a standard may have been violated. NERC strongly encourages self-reporting of any possible non-compliance with reliability standards and prompt mitigation actions.

Many of NERC's compliance functions are delegated to the eight regional entities through formal agreements.

While industry stakeholders played an important role in developing NERC's compliance process, specific enforcement actions and penalty decisions are independently made by NERC's Board of Trustees.

2008: A Year In Review

The first full year of mandatory reliability standards in the United States involved significant growth and development for NERC's compliance monitoring and enforcement program, as the "start-up" organization matured.

Perhaps the most important measure of NERC's compliance efforts, nearly 800 mitigation plans for over 2,400 individual violations were submitted to NERC in 2008. These mitigation efforts show that reliability is being improved across North America as a direct result of NERC's compliance efforts.

On June 4, the first 20 formal notices of penalty for violations of a NERC reliability standard were filed with the Federal Energy Regulatory Commission. A total of 40 notices of penalty, with a total sum of over \$540,000 in penalties, were filed in 2008.

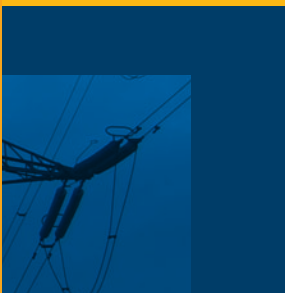
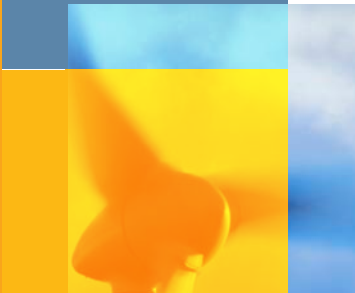
Additionally, NERC and the regional entities performed and posted reports for more than 200 audits in 2007–2008 and participated in 19 investigations.

Findings

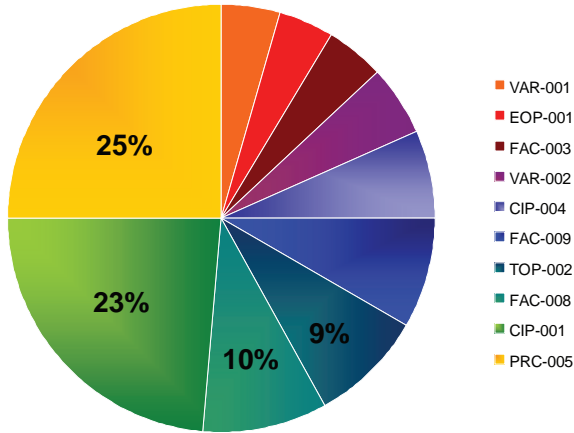
Transmission and Generation Protection System Maintenance and Testing (PRC-005) was the most violated standard in 2008, followed by Sabotage Reporting (CIP-001). The majority of these violations were documentation-related. NERC and the regional entities are considering options to expedite the processing of such low-risk, low-severity violations in 2009.

Mitigation plans submitted to NERC in 2008 are on track for completion, with over 45% of the plans complete. The remaining plans are either associated with violations identified late in the year or are under way according to plan.

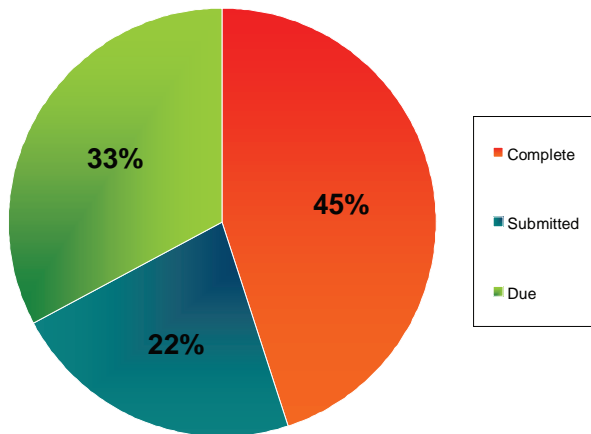
A considerable backlog of compliance violations continued to develop in 2008, as the regional entities and NERC began to move a large volume of initial violations through the compliance process. Resolving this backlog continues to be a priority in 2009.



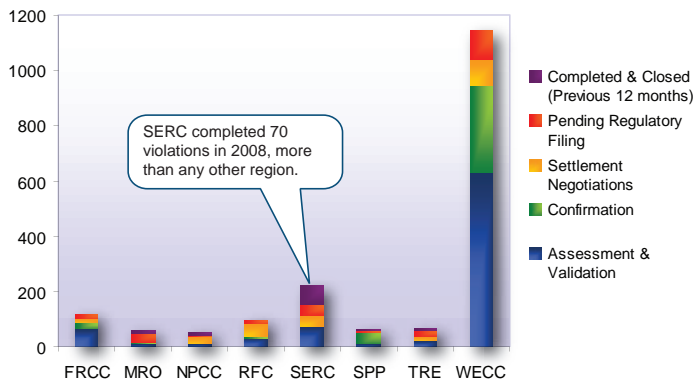
2008 Ten Most Violated Reliability Standards



Status of Mitigation Plans for 2008 Violations



FERC Enforceable Violations by Status Calendar Year 2008



The total number of violations is closely correlated to the size of the region. WECC is NERC's largest region by number of registered entities and functions.



A Closer Look...

Compliance auditors review volumes of material to assess compliance with NERC standards. Over 250 audits have been conducted since June 2007.

awareness & protection

NERC, as the Electricity Sector Information Sharing and Analysis Center, provides leadership, coordination, and technical expertise on critical infrastructure protection and system conditions.

About Critical Infrastructure Protection and Situation Awareness

The newly-formed Critical Infrastructure Protection program coordinates all of NERC's efforts to improve physical and cyber security for the bulk power system of North America, as it relates to reliability. These efforts include standards development, compliance enforcement, assessments of risk and preparedness, disseminating critical information via alerts to industry, and raising awareness of key issues.

Additionally, the program is home to the Electricity Sector Information Sharing and Analysis Center (or ES-ISAC) and monitors the bulk power system to provide real-time situation awareness leadership and coordination services to the electric industry.

NERC's Critical Infrastructure Protection Committee supports and provides technical subject matter expertise to both programs.

2008: A Year In Review

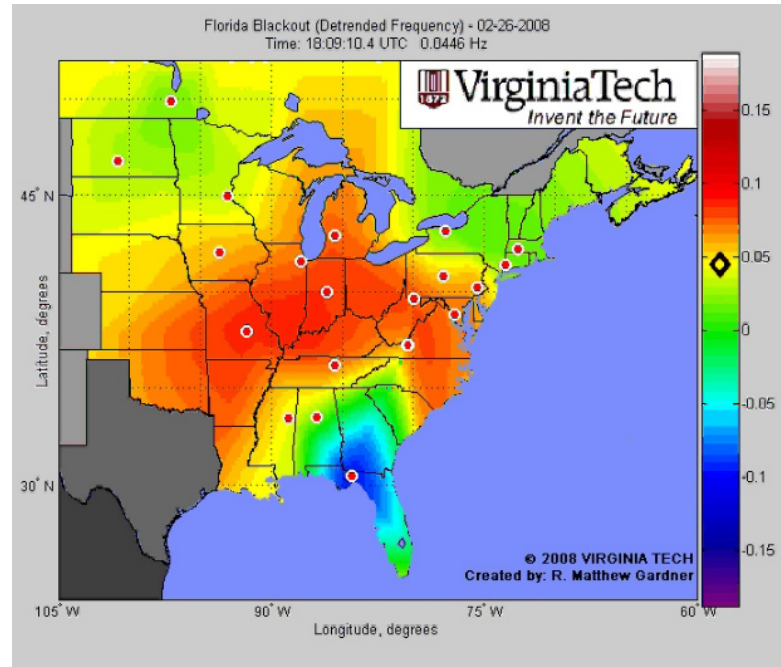
In 2008, NERC streamlined its situation awareness and critical infrastructure protection programs, bringing renowned security expert Michael Assante on board as its chief security officer. Under Assante, the two programs expanded NERC's role in ensuring the security of critical assets, issuing six security-related alerts in the fourth quarter and working closely with industry to begin revisions of the critical infrastructure protection standards.

Recognizing the significance of cyber and physical security concerns to the bulk power system in North America, NERC also established the Electric Sector Steering Group in 2008; a group of industry chief executives who will guide NERC's efforts to address security-related issues in the coming years.

Additionally, 2008 marked several key milestones for NERC's nine critical infrastructure protection standards. In January, the Federal Energy Regulatory Commission in the United States conditionally approved eight standards, requiring NERC to

consider a number of improvements. According to the timeline established in the standards, requirements became enforceable in July of 2008 and work began to strengthen the standards on an abbreviated schedule. The draft standards were published for industry comment on November 18.

2008 was also a year of close collaboration on cyber security with the United States' Congress through the Homeland Security Committee's Subcommittee on Emerging Threats, Cyber Security, and Science and Technology. This collaboration culminated in an unprecedented summit meeting of top government officials and industry chief executives in Washington, DC on September 23. The summit focused on raising the profile and priority of cyber security in the electric



The Big Picture

NERC, through projects like the North American Synchro-Phasor Initiative, supports critical grid monitoring technology across the bulk power system. This chart, reconstructed from the February Florida outage, clearly shows how an event in a remote area of the interconnection can impact the system thousands of miles away, highlighting the need for a wide-area view.



The Smart Grid - Challenge or Opportunity?

While the smart grid promises to bring greater efficiency and functionality to grid operators, it also poses a significant cyber challenge. NERC is actively considering these issues to ensure a secure and reliable energy future.

industry and building public-private partnerships to address this issue.

At the summit, NERC outlined plans to conduct an assessment of the industry's preparedness to appropriately address cyber security threats as well as its plans to develop a comprehensive and continuous security risk assessment process. The preparedness assessment will identify areas in need of improvement and make recommendations to address those concerns in a prioritized manner. The risk assessment will provide a complete landscape of security risks, identify significant trends and provide a common language enabling clear and effective communication about emerging threats.

In addition to its work on cyber security, the critical infrastructure protection program lead the North American Synchro-Phasor Initiative (NASPI) in partnership with the United States' Department of Energy and made significant progress toward driving the adoption of this promising technology across the grid. Approximately 20 synchro-phasors were installed as a result of these efforts in 2008, with notable progress made in ERCOT and PJM. Much work remains to coordinate the collection and visualization of the data generated by the units, but increased interest and commitment to the technology throughout the industry will help to facilitate the resolution of these issues in 2009 and the years to come.

Findings

As illustrated by the public disclosure of the "Aurora" vulnerability late in 2007, cyber security is clearly one of the most critical emerging issues facing reliability today. The ever-changing, immediate, and malicious nature of the threat makes it unlike any other reliability issue covered by NERC standards. Of most concern are vulnerabilities that, if exploited, could result in the simultaneous disruption of many system components or cause physical damage to equipment, causing uncontrollable blackouts or other major system disturbances. The potential to affect many assets at

once is a key difference between cyber and physical security concerns. A comprehensive, effective approach to addressing these vulnerabilities when they arise is essential to reliability. NERC is actively working with its partners in industry and government to put this in place.

Though an important part of plans to integrate plug-in hybrid electric vehicles and additional demand response into the electric grid, the development of the "smart grid" is a specific cyber security challenge. By enabling greater communication between the utility and remote equipment, the "smart grid" may provide more access points to critical infrastructure, potentially increasing the risk for cyber attack. Ongoing standards development efforts - both at NERC and other standards setting bodies - will need to be coordinated to ensure security is appropriately addressed as development continues.

2008 has also made it clear that NERC, as the ES-ISAC and ERO, must improve its situation awareness capabilities in order to provide effective leadership and coordination during a system disturbance. While the tools currently in place improve communications between reliability coordinators, more work is needed to fully address the recommendations from the 2003 blackout report. NERC will make these improvements in 2009.

Protecting the Grid

In 2008, NERC issued 14 Advisory and 3 Recommendation alerts designed to disseminate critical reliability information to key users, owners, and operators of the bulk power system. This preventative action system provides critical threat information, allowing recipients to take action to mitigate vulnerabilities and maintain reliability.

NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

Recommendation to Industry
CIP: Microsoft Out-of-Band Security Bulletin MS08-067

Initial Distribution: October 24, 2008
Additional Information Distributed: November 20, 2008

Limited Exploitation of Vulnerability Has Occurred. Final Reporting Required.

Status: Acknowledgment of Receipt & Reporting Required 2008.
Instructions for acknowledging receipt have been sent to the primary recipients of this Recommendation.

PUBLIC: NO HANDLING RESTRICTIONS
[More on handling >>](#)

Instructions: This NERC Recommendation is not the same as a reliability alert. An organization is not the same as a reliability alert. An organization will not be subject to penalties for a failure to acknowledge receipt of this Recommendation. However, pursuant to Rule 810 of NERC's Reliability Standards, you are required to report to NERC on the status of your organization's response to this recommendation. For U.S. entities, NERC requires that you report to the Federal Energy Regulatory Commission (FERC) on the status of your organization's response to this recommendation.

Recommended Action: All recipients of this Recommendation should review the Microsoft and determine appropriate mitigating steps to a

assessments

NERC conducts detailed resource adequacy assessments compiled from the “bottom up,” offering a more comprehensive view of North America’s energy future.

About Assessments

NERC’s assessments program conducts annual seasonal and long-term reliability assessments, designed to assess the short and long-term resource adequacy and operating reliability of the bulk power system in North America, both existing and planned. The assessments program also identifies and analyzes key issues that may affect reliability, such as market practices, industry trends, or policy measures.

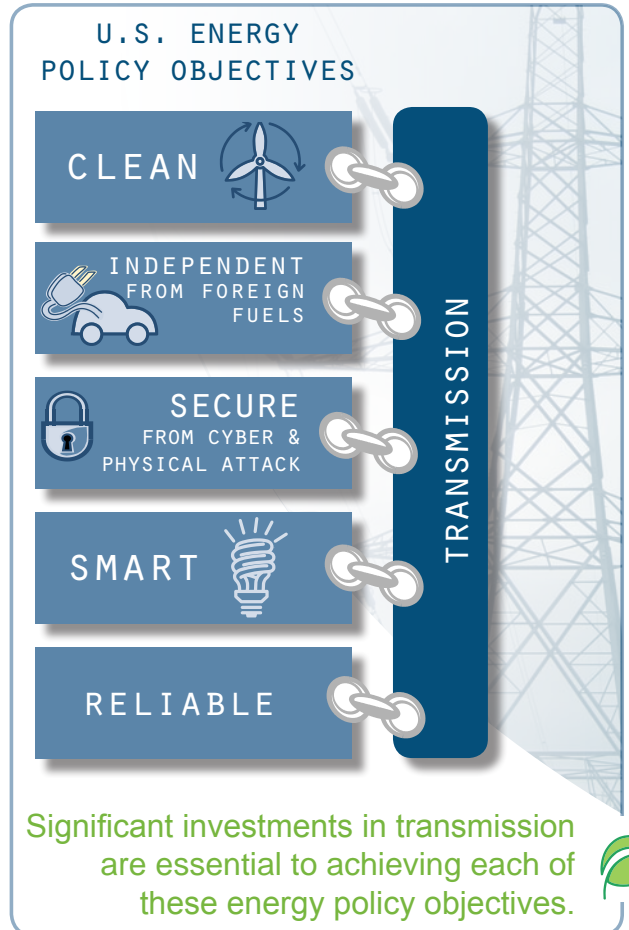
NERC’s assessment program is supported by the Planning and Operating Committees, the Reliability Assessment Subcommittee, Load Forecasting Working Group, and other groups as needed.

NERC assessments are based on data supplied by users, owners, and operators of the bulk power system and gathered by NERC’s eight regional entities. This “bottom up” approach provides greater confidence that local and regional issues are understood and accounted for, details that may be missed by a top-down model.

2008: A Year in Review

2008 marked a number of significant achievements in the assessments program. Beginning with an overhaul of the data collection process in January, the year culminated with the release of the *Long-Term Reliability Assessment* and *Special Report on Electric Industry Concerns on the Reliability Impacts of Climate Change Initiatives* in late October.

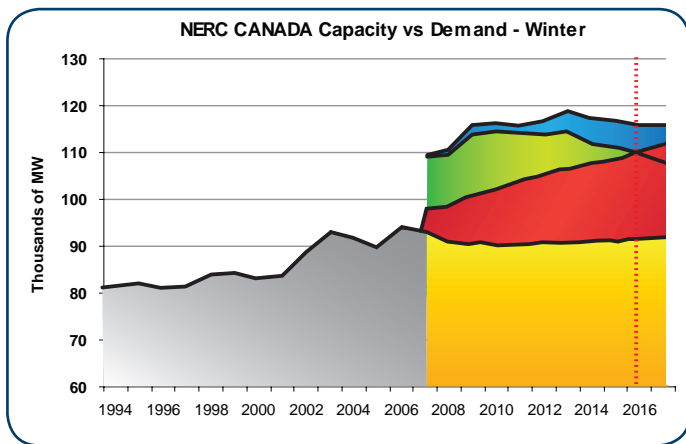
Improvements to data collection completed early in the year drove significant improvements to the entire assessment process, enabling staff to analyze issues in



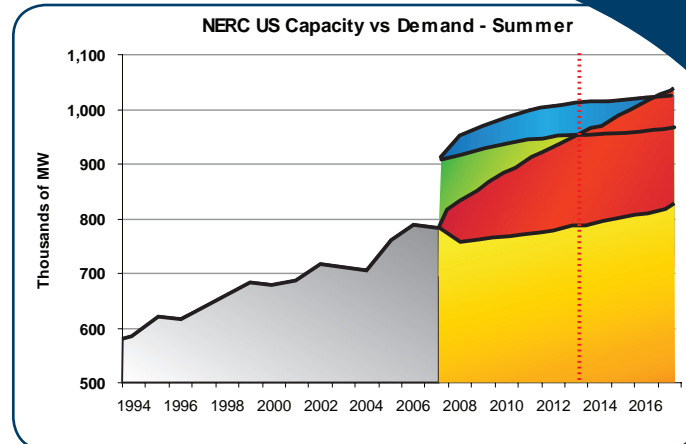
Critically Linked

NERC’s special report on the reliability impacts of climate change initiatives emphasized that transmission is needed to support energy policy objectives.

greater detail and identify findings that were invisible in earlier years. Of significant importance were the retirement of the “committed” and “uncommitted” resource categories and their replacement by more granular resource categories: existing certain and uncertain, planned, and proposed. Enhancements also included adding a “Scenario Analysis” section, where industry was asked to apply a certain test case scenario to their forecasting and report on the results of their study. Conducted on a two-year cycle, the first scenario analysis focused on either the impacts of a continent-



Adjusted Potential Resources
 Net Capacity Resources
 High Demand Projection
 Low Demand Projection
 Historic Demand
 Demand Exceeds Net Capacity



Resources Needed
 NERC's 2008 Long-Term Reliability Assessment shows that more resources will be needed to meet demand in the coming years.

wide 15% renewable portfolio standard or a significant generation fuel shift. Results will be published in a 2009 report.

Other achievements in the assessments program included work on several special reports, on topics including demand response, once-through cooling restrictions considered in section 316b of the Clean Water Act, and documenting industry concerns about the reliability implications of climate change initiatives. Work on the next version of the reliability assessments guidebook is also under way, with publication slotted for mid-2009.

Findings

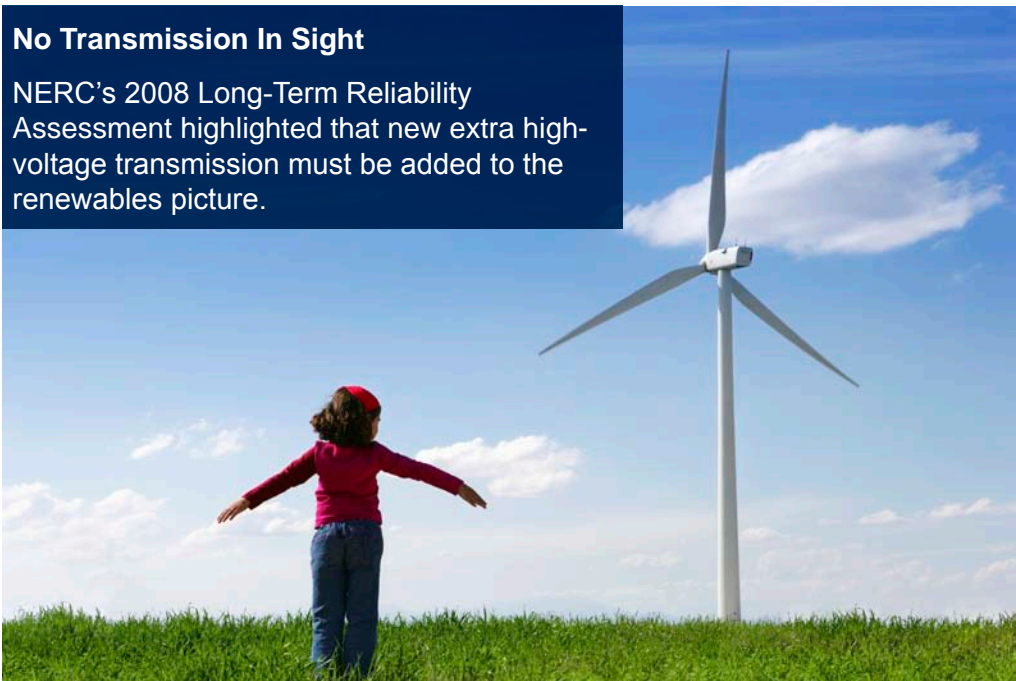
Key findings in 2008 included the need for transmission resources, continued growth in wind generation, the increasing importance of demand-side resources, and the need for further study of reliability performance metrics.

The need for transmission resources is becoming particularly important as new location-constrained resources, such as wind, solar, nuclear, and clean coal with carbon capture and sequestration, are proposed. The integration of wind resources in Texas, for example, will require the addition of 2,300 miles of new transmission in that state alone.

North American-wide, 145,000 MW of new wind generation is proposed over the coming 10 years. Even if only half of this capacity comes into service, it will represent a 350% increase in variable resources over what existed in 2008. Driven in large part by new policies and environmental priorities, this growth will represent one of the largest new resource integration efforts in the history of the electric industry.

Increasing use of demand-response resources to meet peak demand was an encouraging finding in NERC's 2008 assessments, with over 6% of peak demand being met by demand-side resources in some regions. NERC is working to establish a Demand Response Availability Database in the coming years to track the availability of this resource and validate its contribution to reliability. Ultimately, this information will assist system planners as demand response is increasingly included in long-term planning.

No Transmission In Sight
 NERC's 2008 Long-Term Reliability Assessment highlighted that new extra high-voltage transmission must be added to the renewables picture.



analysis & trends

NERC conducts detailed analyses of bulk power system disturbances and tracks reliability performance, focusing on disseminating lessons learned and preventing avoidable outages.

About Analysis & Trends

NERC's event analysis and information exchange program conducts detailed analyses of significant bulk power system events to determine root causes, uncover lessons learned, and alert the industry to potential reliability issues by issuing advisories, recommendations, and essential action alerts to industry. In addition to issuing these "alerts," NERC's event analysis team also issues a set of recommendations directly to the entities involved after a system disturbance, offering expert perspective on reliability improvements. Event analyses are entirely separate from NERC's compliance and enforcement function, though findings are shared between the programs as appropriate.

NERC's reliability benchmarking program identifies and analyzes reliability performance metrics to measure progress in improving current reliability and track leading indicators of future reliability. Findings are published on NERC's website and highlighted in seasonal and long-term reliability assessments as appropriate.

Both programs use NERC staff and industry subject matter experts to deliver technically robust analyses and create the impetus for needed improvements. Various industry groups support these program areas, notably including the Reliability Metrics Working Group, System Protection and Controls Subcommittee, and Transmission Issues Subcommittee.

2008: A Year in Review

2008 marked several unprecedented achievements in these two program areas: issuance of the first "alerts," the launch of the online "Reliability Benchmarking Dashboard" and the first ever inclusion of reliability performance statistics in the Long-Term Reliability Assessment.

NERC issued 17 alerts in 2008, generated by its events analysis and critical infrastructure protection programs. Covering issues from cyber vulnerabilities to lessons learned on relay maintenance practices, alerts allow NERC to quickly and efficiently disseminate information about current and emerging reliability issues. Though still maturing, the alerts program holds significant promise in helping owners, operators, and users of the bulk power system improve reliability. NERC's most recent Recommendation to Industry had a 94% response rate.

The July launch of the reliability performance section on its website fulfilled a commitment in NERC's Rules of Procedure to raise awareness of reliability performance through an online portal. The section provides a high-level overview of key reliability metrics and trends, highlighting areas of interest.

The assessment of reliability performance included in the 2008 Long-Term Reliability Assessment represented an initial step toward an annual analysis of bulk power system performance trends. The Reliability Metrics Working Group and Operating Committee contributed to this document and are working to improve the report in 2009.

To support its events analysis efforts, NERC sought to maximize regional expertise through the formation of the Event Analysis Coordinating Group in December 2008. The group now provides coordination between the regions and Interconnections to facilitate

Finding the Facts

NERC's Event Analysis team analyzes bulk power system events, leading to recommendations to industry and improvements to NERC's standards.



consistency in event analyses to ensure that NERC and regional event analyses are complete, accurate, and timely.

Findings

Overall, 2008 was an average year for bulk power system reliability in North America, punctuated only by the February outage in Florida, which was followed by a relatively mild and uneventful summer peak demand season across the continent. Disturbance statistics (shown to the right), while marking some improvement over prior years, indicate there is still room to improve. Protection system misoperations continued to be a leading contributing factor to the disturbances. Other contributing factors to 2008 disturbances were equipment failure, vegetation contact with transmission lines, and human error.

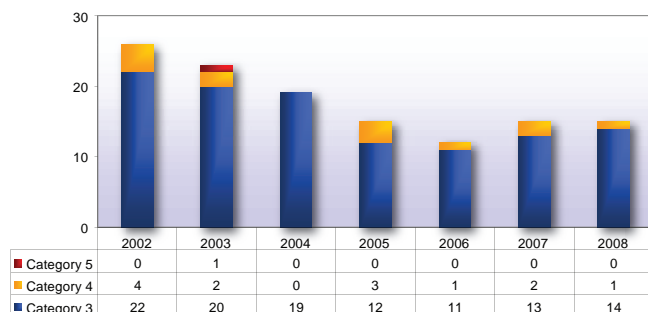
Vegetation management, a leading cause of the August 14, 2003 blackout and one of NERC's most frequently violated standards in 2008, remains a cause for concern with 11 transmission line outages caused by vegetation contact from within the right-of-way in 2008 (below).



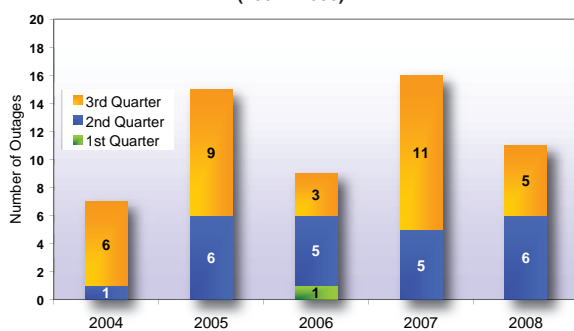
Tracking Progress

In July 2008, NERC launched a suite of online reliability and performance indicators. Visit it online at www.nerc.com

Number of Disturbance Events by Severity & Year (2002 - 2008)



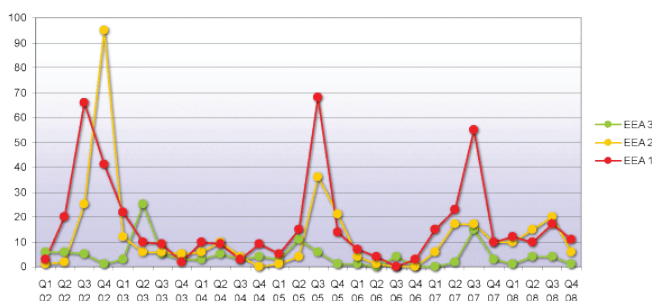
Vegetation-Related Transmission Outages Grow-Ins From Within the Right-of-Way (2004 - 2008)



Bulk Power System Disturbances by Cause



Number of Energy Emergency Alerts by Quarter (2002 - 2008)



certification

The system operator certification and continuing education program ensures that grid operators are skilled, trained, and qualified to operate the bulk power system.

About Certification & Continuing Education

NERC's System Operator Certification and Continuing Education programs ensure that the personnel operating the bulk power system have the skills, training, and qualifications they need to operate the system reliably. NERC maintains the credentials for over 5,000 system operators, effectively licensing them to work in system control centers across North America.

NERC's system operator certification exam is designed to test specific knowledge of job skills and reliability standards, preparing operators to ensure standards are met and quickly and confidently react when unexpected situations occur. Once an operator passes the certification exam, he or she is required to maintain certification through completing NERC-approved continuing education activities.

The certification exam is created by the Personnel Certification Governance Committee, a group of operational experts, trainers, and supervisors. Exams are continuously updated on an 18-month cycle.

2008: A Year In Review

In 2008, NERC completed the transition to a new operator certification database, streamlining the certification process and allowing system operators to track the status of their certification online. In 2008, nearly 400,000 continuing education credits were completed and tracked through the new system.

NERC also completed work on several standards related to personnel certification, including the development of PER-005-01,

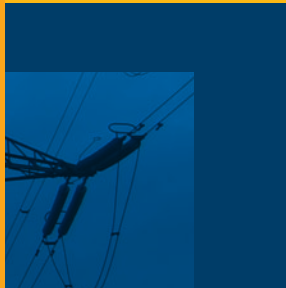
approved by NERC's Board of Trustees early in 2009. This standard strengthens and clarifies existing training requirements and puts a focus on defining skills required for a specific operating environment.

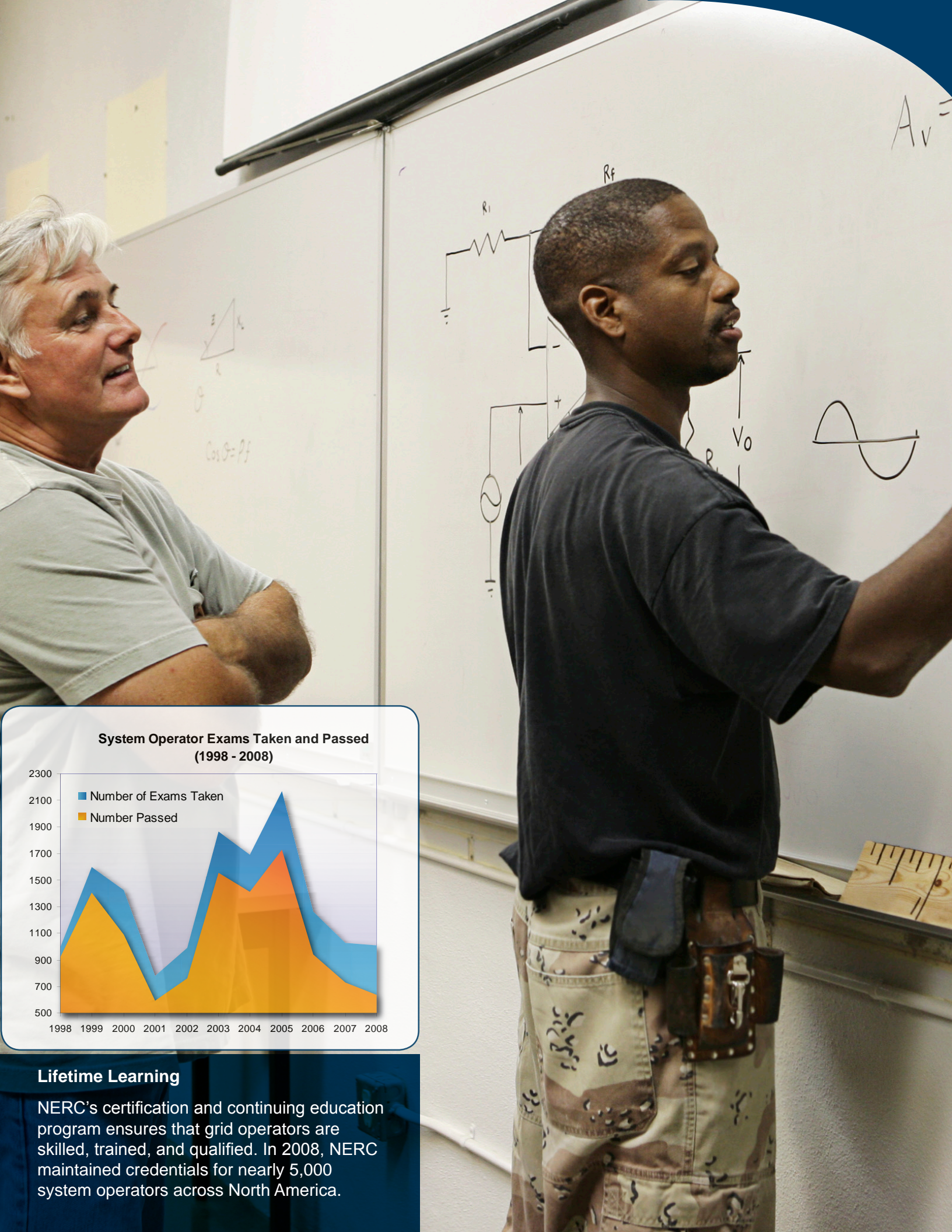
In 2009, NERC will consider ways to implement a voluntary advanced certification credential for system operators who wish to demonstrate exceptional skills and experience to their employers. This credential will help foster a culture of lifetime learning in the control center, keeping operators up to date on new equipment and challenging senior operators to excel in their careers.

NERC will also seek ways to address the human factor in system protection failures through a focus on training, education, and, potentially, certification. Efforts in this area will focus on ensuring personnel have the skills they need to avoid common system design, modeling, and troubleshooting errors marked as significant contributors to system disturbances.

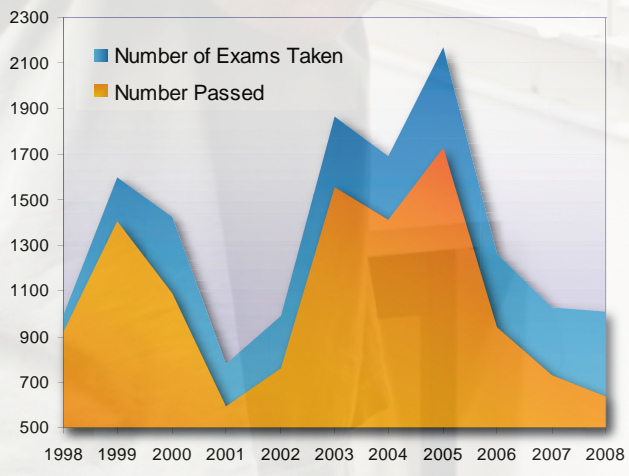
Findings

As operators begin to maintain their certification through continuing education hours, the total number of test takers has steadily declined over the past three years (as shown to the right). In 2008, 67% of test takers were individuals seeking their first operator certification. As a result, the passing rate on exams has declined as well, reaching only 63% in 2008, compared to 92% in 1998. NERC expects this trend to continue especially as existing operators begin to retire.





System Operator Exams Taken and Passed (1998 - 2008)



Lifetime Learning

NERC's certification and continuing education program ensures that grid operators are skilled, trained, and qualified. In 2008, NERC maintained credentials for nearly 5,000 system operators across North America.

history

June 1, 2008 marked the 40th anniversary of NERC's formation as the National Electric Reliability Council. NERC was formed in the aftermath of the 1965 Northeast Blackout to help utilities work together to prevent future blackouts. Working with its member regional reliability councils, NERC developed and maintained voluntary policies, criteria, standards, and guides for reliable planning and operation of the North American bulk power system. In 1981, NERC changed its name to the North American Electric Reliability Council to recognize Canada's increased participation in NERC activities.

Beginning in the mid-1990's, NERC began to make the case for mandatory reliability standards, as the voluntary reliability framework was judged insufficient to ensure reliability in a restructured and increasingly competitive electricity marketplace. These efforts culminated in 1997 with independent recommendations by NERC's Electric Reliability ("Blue Ribbon") Panel and the U.S. Department of Energy's Electric System Reliability Task Force that reliability standards for the bulk power system should become mandatory and enforceable. The groups recommended that an independent, self-regulatory electric reliability organization should be established to develop and enforce these standards throughout North America, concluding that federal legislation in the U.S. was necessary to accomplish this important task.

The NERC standards became mandatory and enforceable in Ontario, Canada in May of 2002, when this province became the first North American government entity to make reliability standards mandatory in Canada. Other Canadian provinces are following suit, with the NERC standards mandatory and enforceable in New Brunswick and agreements in place or under development between NERC and the remaining provinces.

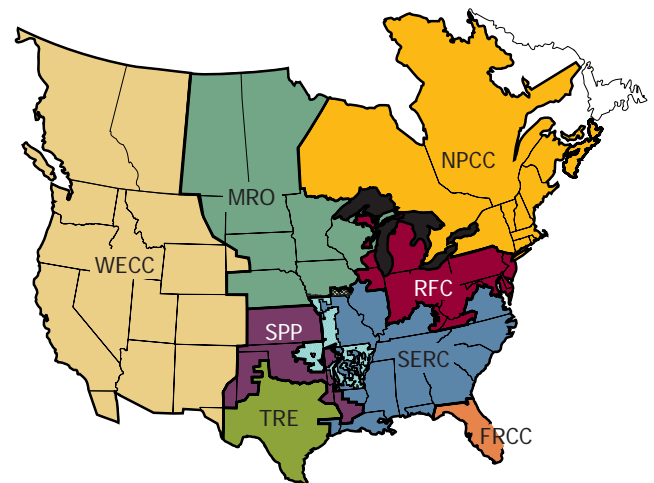
In the U.S., NERC proposed legislative language on the creation of an "electric reliability organization" in 2000. In August 2005, a shortened version of this language was approved and signed into law as part of the Energy Policy Act of 2005.

NERC was named the "Electric Reliability Organization" (ERO) in 2006 and, on January 1, 2007, the North American Electric Reliability Council became the North

American Electric Reliability Corporation as it took on its new role.

As the ERO, NERC's relationship to its stakeholders changed significantly, as it has changed from a voluntary organization to an international regulatory authority. While NERC as a council had been driven primarily by its member regional reliability councils, as the ERO, NERC now delegates some of its authority to the eight regional entities and oversees the execution of those authorities through formal delegation agreements.

On June 18, 2007, the first reliability standards became mandatory and enforceable in the U.S., marking a significant milestone in the history of the ERO. Since that date, NERC has processed thousands of violations to its standards and continues to enhance, develop, and track its standards efforts.



A Regional Approach

NERC works closely with eight regional entities to achieve its mission:

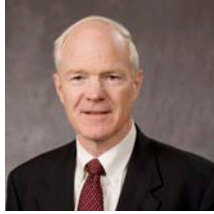
- Florida Reliability Coordinating Council (FRCC)
- Midwest Reliability Organization (MRO)
- Northeast Power Coordinating Council (NPCC)
- ReliabilityFirst Corporation (RFC)
- SERC Reliability Corporation (SERC)
- Southwest Power Pool Regional Entity (SPP)
- Texas Regional Entity (TRE)
- Western Electricity Coordinating Council (WECC)

leadership

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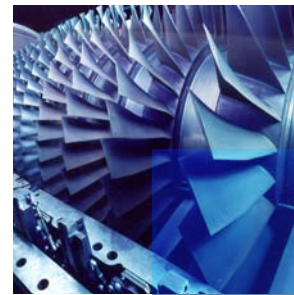
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to ensure
the reliability of the
bulk power system

