

2 0 2 2

ANNUAL REPORT



RELIABILITY FIRST

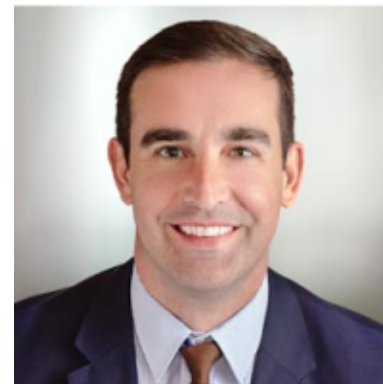


TABLE OF CONTENTS

3	Message from the Board Chair
4	Message from the President and CEO
5	About Us
6	Strategic Plan
7	Noncompliance Trends and Takeaways
9	Lessons Learned from the COVID-19 Pandemic
10	Message from the Chief Security Officer
11	Resilience Efforts
12	Facility Ratings and Vegetation Management
13	Cold Weather Preparedness
14	Misoperations
15	Outreach
16	Changing Resource Mix and State Outreach
17	Organizational Advancements

LETTER FROM THE BOARD CHAIR

2022 was an eventful and productive year for ReliabilityFirst (RF). As you will see throughout this Annual Report, RF worked across departments to address key risk areas such as facility ratings, vegetation management, cold weather preparedness, misoperations, and the changing resource mix. The report also includes compliance monitoring and enforcement trends and lessons learned from the pandemic, and discussions of RF's extensive outreach work and resilience efforts.



RF looked to the future in 2022, as work took place to develop the 2023-2027 Strategic Plan. The Strategic Plan, and the collaborative effort to create it, is discussed within this report.

Simon Whitelocke's term as Board Chair concluded at the end of 2022, and the Board and RF as a whole have benefited from his leadership and wisdom during his chairmanship. I'm happy to share that he is remaining on the Board.

Brent Greene, a founding RF Board member, completed his term on the Board at the end of 2022. On behalf of the entire Board, I would like to thank him for his years of service and valuable contributions to RF.

I'd like to welcome our new Board members: Lesley Evancho, our new Independent Director, is the Chief Human Resources Officer for EQT Corporation, and Scott Hipkins, our new Director for the Transmission Sector, is the Vice President of Cyber Security and Chief Information Security Officer at FirstEnergy. Lesley and Scott bring with them a wealth of HR and IT security expertise that will be of great value to the Board and RF.

Finally, I'd like to thank all the individuals and organizations who worked with RF in 2022. In 2023, RF will continue its work to further meaningful, risk-based regulatory oversight and outreach. I look forward to our continued work together to enhance reliability.

Forward together,

Antonio Smyth

Board Chair

LETTER FROM THE PRESIDENT AND CEO

The electric industry continues to evolve and 2022 was no different. The rapid pace of change is swirling all around us, from new and increased cybersecurity threats, to evolving workplace demographics, to extreme weather and the changing generation mix. These challenges may seem daunting, but I have no doubt that if we embrace them, they can drive us forward as an industry.



In 2022, RF pushed into a new frontier, state outreach. We began in January, with Jim Robb and I appearing before the Indiana General Assembly and we continued throughout the year, talking to every state commission in our footprint and laying the groundwork for more critical conversations to come in 2023. Part of the team leading this charge is our new Vice President of Entity Engagement and Corporate Services, [Diane Holder](#), who joined us in 2022 from Pennsylvania American Water and previously worked for nearly 30 years in the electric utility industry.

While our state outreach efforts are emblematic of the new frontiers we must embrace to keep up with the pace of change facing our industry, there are other challenges on the horizon we must prepare for as well. We produced our [2023-2027 Strategic Plan](#) in 2022, which lays out our vision and priorities for facing what lies ahead. Some risks we know about, but others have yet to reveal themselves. I continue to urge you to maintain accurate facility ratings, keep misoperations low, prepare for extreme weather, and practice strong cyber hygiene, so we can be ready to deal with the unknown risks of tomorrow.

I thank our Board for its continued support as we forge ahead in these uncharted waters. I would like to thank Simon Whitelocke for his leadership over the course of the last two years as our Board Chair, and welcome Antonio Smyth and Nelson Peeler as our new Board Chair and Vice Chair. I would also like to thank departing Independent Director Brent Greene for his service and welcome Lesley Evancho and Scott Hipkins to the Board.

On behalf of everyone at ReliabilityFirst, we appreciate your many contributions to ensuring the reliability and security of the Bulk Power System. By working together, remaining vigilant and proactive, we can be ready for whatever comes our way in 2023.

Forward Together,
Tim Gallagher
President and CEO

ABOUT RELIABILITYFIRST

Our Mission, Values, and Work

Our Mission:

To serve the public good and support health and safety through preserving and enhancing the reliability, security and resilience of the grid.

Our People:

To foster a respectful, collaborative environment where employees can be and feel like the best version of themselves.

Our Transparency:

To be open and honest about what we are trying to accomplish, and why, to foster productive dialogue.

Our Fairness:

To be reasonable and consistent.

Our Accountability:

To act with integrity, take pride in our work and responsibility for our actions, and deliver exceptional results.

Our Creativity:

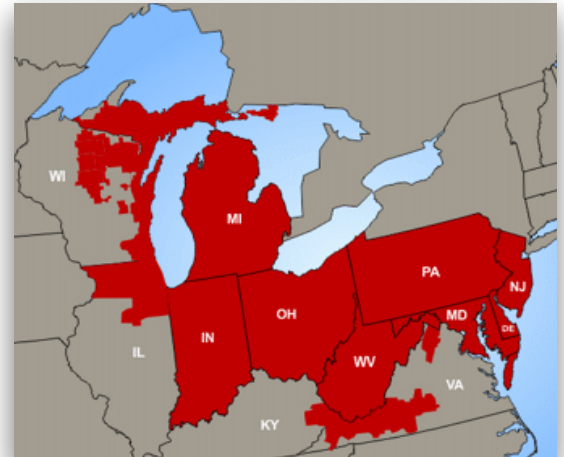
To encourage and reward innovative ideas and approaches.

Our Work:

To ensure the reliability of the bulk power system in the United States, Congress passed the Energy Policy Act of 2005, creating a new regulatory organization called the Electric Reliability Organization (ERO) to establish mandatory Reliability Standards and monitor and enforce compliance with those standards for those who own, operate or use the interconnected power grid. FERC approved NERC as the ERO under section 215 of the Federal Power Act and NERC delegates authority to six Regional Entities.

Our team identifies and prioritizes risks facing the grid, determines mitigation strategies to address them and uses communications and outreach to drive awareness and ensure risk resolution. Our program areas and services include: Compliance Monitoring; Enforcement; Operational Analysis & Awareness; Registration and Certification; Engineering & System Performance; Resilience & Risk; Risk Analysis & Mitigation; Standards; Entity Engagement & Training and Outreach.

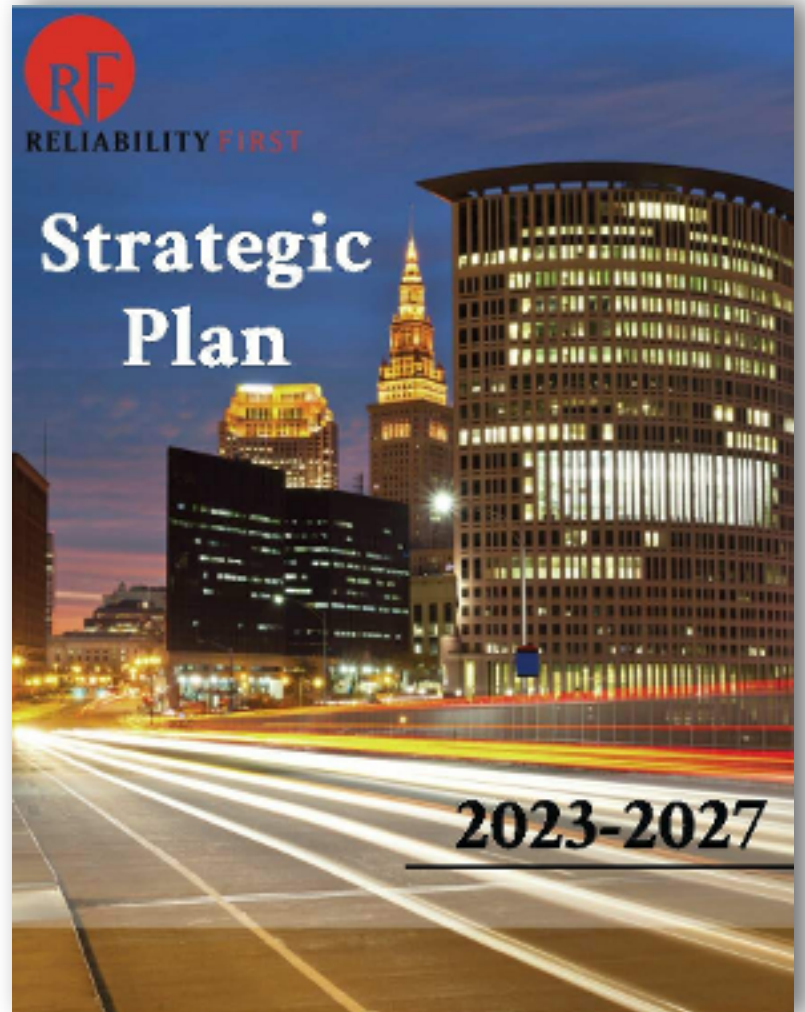
RF is proud to be the Regional Entity responsible for all or portions of Delaware, New Jersey, Pennsylvania, Maryland, Virginia, Illinois, Wisconsin, Indiana, Ohio, Michigan, Kentucky, West Virginia, Tennessee and the District of Columbia. Collectively, NERC and the Regional Entities are referred to as the ERO Enterprise.



2023-2027 STRATEGIC PLAN

In 2022, RF worked to create a new [2023-2027 Strategic Plan](#). The Strategic Plan will guide RF's efforts to ensure reliability, security, and resilience, and it sets forth three strategic objectives:

- **Be an Excellent Regulator**
 - Consistently demonstrate accountability, transparency and efficiency through our model.
 - Commit resources to collaboration and security.
 - Build deep knowledge of our entities and use it to serve our footprint.
- **Cultivate a Highly Engaged, Talented Workforce**
 - Recruit, retain and train the right people for the right roles.
 - Further enhance and promote diversity, equity and inclusion.
 - Prioritize our positive workplace culture.
- **Harness Knowledge to Comprehensively Address Risk**
 - Quickly deploy communications to mitigate risk based on our data and perspective.
 - Develop targeted outreach strategies.
 - Enhance our value as an independent resource and broaden our reach.



The Strategic Plan resulted from a collaborative development process which included members of the RF Board of Directors, the Board of Directors Strategic Plan Steering Committee, RF staff, and stakeholders. Thank you to all involved in this process, and RF looks forward to bringing the Strategic Plan's objectives to fruition through our actions over the next five years.

NONCOMPLIANCE TRENDS AND TAKEAWAYS

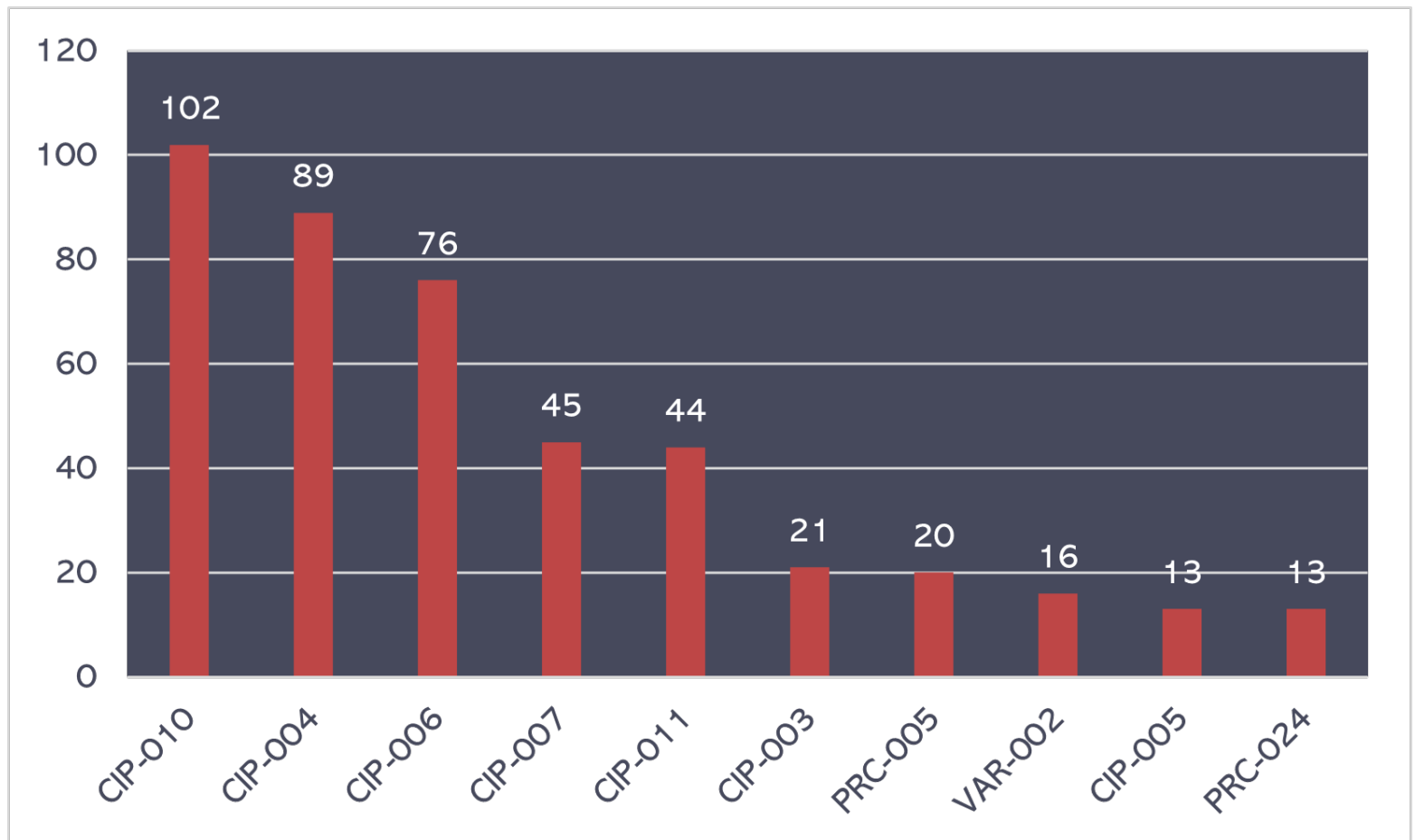
RF continuously reviews compliance and enforcement data to identify risks, trends, and lessons learned. Throughout 2022, RF has shared this data and information through multiple forums, including webinars, newsletter articles, and Board meetings to bring transparency and clarity to the CMEP processes and share lessons learned so entities can implement best practices and mitigate risks. The following overview highlights some of the risks and trends reviewed in 2022.

Most Violated Standards

Since the implementation of CIP version 5, the number of noncompliances with CIP Standards has consistently outpaced those in the Operations and Planning space, with CIP noncompliances comprising between 65-80% of noncompliances year-over-year.

The sustained high volume is in part due to a handful of “high-frequency conduct” CIP requirements (e.g., CIP-007-6 R2 patch management and CIP-010-2 R1 change management), that govern activities that occur often and cover numerous assets and people, leading to more opportunities for noncompliance.

While many of these issues pose low risk, vigilance is nonetheless essential (as discussed later in this report by RF Chief Security Officer Marcus Noel). The graph below depicts the 10 most violated Reliability Standards in 2022 in the RF footprint.



NONCOMPLIANCE TRENDS AND TAKEAWAYS

CIP Trends and Takeaways

CIP-007 (systems security management), which has been the most violated Standard by a large margin since the CIP Standards became effective, shifted down to the fourth most violated Standard in 2022, and CIP-010 (configuration change management and vulnerability assessments), previously third most violated, leapt to the top violated Standard in 2022. Of those CIP-010 noncompliances, 96% were noncompliances with R1 (configuration change management).

Despite this being a high-frequency conduct requirement, the elevated frequency was of note and RF conducted additional outreach in this area. Additionally, of the 94 CIP-010 R1 noncompliances processed in the past two years, approximately 20% of them were assessed at moderate or serious risk, supporting the need for additional outreach and assurance in this area.

Operations and Planning Trends and Takeaways

While there are far fewer Operations and Planning noncompliances, a higher proportion of those noncompliances are generally classified as moderate or serious risk compared to CIP noncompliances. This is particularly true in the case of facility ratings issues, which remained an RF and ERO priority in 2022.

PRC-005 and VAR-002 continued to be the most frequently violated Operations and Planning Standards in the RF footprint and across the ERO. Approximately 50% of the PRC-005 and VAR-002 noncompliances processed over the past two years were disposed of as moderate risk. One of the driving factors in the frequency of moderate risk PRC-005 noncompliances was the extensive duration of these noncompliances, which resulted from inadequate tracking mechanisms and internal controls around periodic activities. Reviewing and testing controls around testing and maintenance periodicity is a key area to focus on in 2023.

Inventory and Self-Reporting

Due to prioritization changes and increased processing efficiencies, RF has eliminated a significant portion of its older open violations. The result was that 97% of open violations by the end of 2022 were identified in the past two years (2021 and 2022). And in 2022, consistent with prior years, approximately 93% of the noncompliances discovered were either self-reported or self-logged, showing the continued diligence and success of entities in identifying noncompliances.

COMPLIANCE MONITORING AND ENFORCEMENT: LESSONS LEARNED FROM THE COVID-19 PANDEMIC

The COVID-19 pandemic fundamentally changed the way we work. Initially, it forced us to make judgment calls on what activities were necessary to perform our functions, and what work should be postponed due to safety concerns. As RF transitioned to a new normal, we continued to optimize efficiency gains and other improvements realized during the pandemic, and identified areas where we can continue to enhance the way we work going forward. In 2022, RF's Compliance Monitoring and Enforcement group performed a review of all activities during the pandemic, and identified a few lessons learned and focus areas going forward.

RF's work as a regulator and in improving how we monitor and enforce the NERC Reliability Standards is not something we take lightly. The pandemic challenged us to work more efficiently, engage more purposefully, and focus resources where they are most impactful. We were able to quickly adapt through collaborating with our peers. And in the spirit of continuous improvement, we'll continue to reflect on the lessons learned during the pandemic to identify more efficient and effective ways to work.

Lessons Learned

Adapt and be nimble

We quickly shifted how we work due to safety concerns and to comply with entities' visitor restrictions. Going forward, RF will continue to conduct many activities virtually, using cameras and other collaboration tools that became more standard during the pandemic.

Risk-focused

While RF is always striving to be risk-based, the pandemic showed us that certain lower risk matters can be resolved or managed in a manner that is even more streamlined than the way we were handling them. We'll continue these efforts to focus our resources where there are the greatest risks.

Communicate Often

Communicating early and often was paramount to our success during the pandemic in executing our duties. We established more routine and easier communication channels and we will strive to continue this increased communication going forward.

Build and maintain relationships

Strong relationships with our teams, our Regional peers, and with entities helped us to accomplish our vital work during the pandemic.

Many relationships grew stronger because we were more purposeful about engaging and had to work through new issues together. These relationships allow us to work more collaboratively with our peers and entities.

LETTER FROM THE CHIEF SECURITY OFFICER

2022 was a year of economic inflation and geopolitical tension. All eyes have been on Russia, China, Iran and North Korea. Amid the global uncertainty, in the electric utility industry specifically we've seen a steady influx of OT-based attacks and an uptick in physical security sabotage events.

Preparation is key. For most, or maybe all organizations, it's not a matter of *if* you'll have a big security incident, but *when*. It's imperative that we detect potential security events early and that we practice response.



Incident response is like a muscle - simulated exercises are not just for finding gaps in your plan. We have to rehearse so that those steps (identification, containment, eradication, recovery) become second-nature to us. We have to know who we will communicate with and when and what information we need to have.

We've been practicing internally. We've been offering to help others practice. And we've been looking for new ways to practice.

To that end, we held a statewide cross-sector crisis communication drill focused on the state of Ohio. We brought together utilities (electric, water, and gas), government partners (city, state, and federal), law enforcement, healthcare, communications and high profile customers. The scenario involved a physical security sabotage that affected everyone within a 30-mile radius. Just by having some of those people in the same room together, the event was a success before the scenario even started.

We watched the handoff between city, county and state emergency management offices. We observed how a major hospital would interact with city and state agencies in a time of crisis. We worked together to address a really bad scenario - and we found a few planning gaps. Everyone left the event with questions to ask, things to address, and new contacts in their hip pocket. It was a win and we'll be looking for more opportunities to help.

Marcus Noel

Chief Security Officer



RESILIENCE EFFORTS

Cyber and physical attacks on the grid (both domestic and foreign) continue to increase, making resilience a critically important area for the ERO and the industry. In 2022, entities continued to utilize our suite of resilience tools. RF also cohosted a national security and resilience conference and organized the Ohio Security Tabletop, a statewide security tabletop exercise.

RF's resilience tools include the [Incident Response Performance Assessment Tool](#) (IRPAT), which provides tabletop exercises for entities to evaluate and practice their incident response capabilities.

The [Cyber Resilience Assessment Tool](#) (CRAT) allows entities to evaluate and benchmark their cyber resilience posture. Finally, the [Insider Threat Preparedness Maturity Assessment Tool](#) (InTP) is a self-assessment tool to help entities evaluate and enhance their insider threat programs.

RF's resilience tools are voluntary and take place

outside the compliance and enforcement space. To find out more about these tools, contact [Mike Hughes](#) or see our [website](#).

In October, RF co-hosted GridSecCon 2022 with NERC and the E-ISAC. The event included training, panel discussions, and breakout sessions on various security and resilience topics, and featured speakers from the U.S. Department of Homeland Security, FBI, FERC, Idaho National Laboratory, and experts from electric utilities across the country.

Throughout the year, RF staff worked to develop and organize the Ohio Security Tabletop, a statewide tabletop security exercise simulating

an attack on critical infrastructure with participants from the healthcare, telecommunications, government, law enforcement, and utility sectors.

RF created the Ohio Security Tabletop to help address risks posed by extreme cold weather (such as the 2021 Texas event), electromagnetic pulses, and cyber and physical security terrorist attacks.

The goals for the Ohio Security Tabletop included strengthening relationships between critical infrastructure sectors, improving disaster and emergency response preparedness, strengthening communication channels with government agencies, and identifying possible areas for improvement in a hypothetical environment.

The exercise took place in February 2023, with wide attendance from stakeholders across Ohio. As a result of this feedback, RF plans to expand the tabletop concept to other states in 2023.



FACILITY RATINGS AND VEGETATION MANAGEMENT

Robust facility ratings and vegetation management programs are critical to BPS reliability. System operators depend on facility ratings to control and operate the system, and vegetation encroachments on transmission lines can lead to cascading outages.

In 2022, RF and the ERO Enterprise continued to focus on these key risk areas with a combination of outreach and monitoring. In April, RF held a facility ratings webinar, where experts from RF, FERC, PJM, MISO, AEP, Aurora Generation, and PPL discussed challenges, lessons learned, and best practices.

We also provided facility ratings presentations during our Tech Talk webinars throughout the year. In the compliance monitoring space, our compliance monitoring staff planned and performed monitoring engagements tailored to the specific risks facing each entity. This risk-based focus was also incorporated into facility ratings field walk downs throughout the year.

In October, the ERO Enterprise released a [Facility Ratings Themes and Best Practices Report](#) that identified four themes associated with entity facility ratings issues: lack of awareness, inadequate asset and data management, inadequate change management, and

inconsistent development and application of facility ratings methodologies.

The report also includes best practices identified during ERO activities, and input from entities on what has worked well for them.

A key takeaway from the report is the importance of routine monitoring of facility ratings programs and their controls to ensure they remain effective and sustainable. To highlight this, the ERO Enterprise is developing a Change Management Webinar, scheduled for May 2023, which will focus on creating sustainable facility rating programs.

In the area of vegetation management, RF adopted a new approach for performing [FAC-003](#) field walkdowns. These field walkdowns allow RF staff to work directly with field and compliance personnel to discuss and address vegetation related reliability risks. Our staff also conducted one-on-one outreach with entities on vegetation topics and any challenges they wished to discuss.

RF also offers a vegetation management Community of Practice for entities. Contact Thomas Teafatiller (thomas.teafatiller@rfirst.org) if you are interested in joining.

COLD WEATHER PREPAREDNESS

The extreme cold weather events from 2021's Winter Storm Uri and 2022's Winter Storm Elliott underscore the importance of cold weather preparedness to the reliability of the grid and the overall safety and well-being of our country. RF and the wider ERO Enterprise conduct annual activities to help address the risks posed by extreme weather, and these efforts expanded in 2022.

As part of RF's winter preparedness program (in place since 2014), staff experts survey generator owners and operators and conduct generator site visits every year to assess and help enhance winter readiness in our footprint.

During the visits, we evaluate the readiness of generating facilities for the upcoming winter season, discuss any concerns, and share best practices. In 2022 following Winter Storm Uri, RF conducted multiple generator site visits and collected information from entities on their training programs, winter preparedness plans, and fuel supplies.

RF also performed broader outreach activities for the industry, including presentations on the winter preparedness program, winter 2021-2022 performance, and entity perspectives on implementing cold weather recommendations from the 2021 Winter Storm Uri event.

RF's Transmission and Generator Committees discussed cold weather topics throughout the year, and RF staff participated in the ERO standards development team that developed the two recently approved winterization standards, [EOP-011-3](#) (Emergency Operations) and [EOP-012-1](#) (Extreme Cold Weather Preparedness and Operations).

Immediately following 2022's Winter Storm Elliott, FERC, NERC, and the six Regional Entities initiated a Joint Inquiry to evaluate the performance of the BPS during the event and identify lessons learned and any recommended actions going forward.

Specific areas the Joint Inquiry team is examining include cold weather preparedness, load forecasting, generation performance, natural gas availability, grid constraints, and emergency conditions and actions. The final report is expected later in 2023.

MISOPERATIONS

Misoperations occur when a protection system such as a relay fails to operate, operates too slowly, or operates when it shouldn't during a fault or a non-fault condition.

Misoperations can worsen the severity of BPS disturbances, and the ERO Enterprise has engaged in a multi-year effort working with entities to help drive down the number of misoperations across North America. For the eighth consecutive year, the number of misoperations in the RF footprint decreased in 2022, showing that ERO Enterprise and industry efforts are reducing this risk.

Throughout the year, our engineering staff conducted one-on-one outreach sessions with selected entities to discuss our analyses of misoperations in their areas and discuss best practices and next steps.

We also conducted broader misoperations outreach in various forums, including the human performance workshop and the protection system workshop.

RF's Protection System Subcommittee meetings are a valuable resource for entities seeking to improve their misoperations rate. They provide a space to share issues, lessons learned, and best practices, and feature a quarterly misoperations peer review process to review and evaluate the accuracy of MIDAS¹ data.

Please visit the Protection System Subcommittee page on our website if you are interested in joining.



¹Protection system operations and misoperations are reported by Transmission Owners, Generator Owners, and Distribution Providers through the Misoperation Information Data Analysis System (MIDAS) portal on a quarterly basis.

OUTREACH

A key component of RF's risk based approach is our outreach program, where RF provides information on risks facing the industry and mitigation strategies.

In 2022, COVID-19 health guidelines began to ease and allowed RF to host more in-person and hybrid outreach events.

Technical Talk with RF (Tech Talk) is RF's monthly open webinar and forum, which continued to grow in 2022. Tech Talk averaged 297 attendees per event, a 10% increase from 2021.

Some of the many topics covered during Tech Talk this past year included supply chain management, renewable resources, and facility ratings. Tech Talk also featured guest speakers from FERC, NERC, the North American Transmission Forum, the Department of Energy, and our fellow Regional Entities.

With a focus on the transformation of the grid, RF's two-day hybrid Fall Workshop was a success. This event was our first in-person workshop since before the pandemic, although we also provided a live virtual broadcast to our stakeholders. RF's subject matter experts were joined by additional Regional Entity and industry experts, and guest presentations from Mark Lauby, NERC Senior Vice President and Chief Engineer; Robert Lee, Dragos Inc. CEO and Co-Founder; Heather Baldwin, Micron Technology Inc. Vice President of Indirect Procurement; and RF CEO Tim Gallagher.

In addition to our monthly Tech Talks and annual Fall Workshop, RF also offered a variety of targeted webinars to our stakeholders throughout the year.

We hosted a Commissioning Webinar, an event focused on FERC, NERC, and the Regional Entities' joint review of protection system testing and commissioning programs and procedures.

In April, we hosted a Facility Ratings Webinar, which discussed FERC's Order 881 and the use of ambient adjusted ratings.

In August, we hosted our annual Protection System and Human Performance workshops.

RF has a full slate of outreach events scheduled for 2023 on key reliability topics, including topics highlighted throughout this Annual Report. Please see our social media and our quarterly newsletter for updates on upcoming events.



CHANGING RESOURCE MIX AND STATE OUTREACH EFFORTS

State public utility commissions and legislatures play a key role in helping to ensure reliability, especially now as the generation resource mix is quickly evolving to include more intermittent resources with different operating characteristics. In recent years, RF and the ERO Enterprise have focused on serving as technical resources for the states on reliability issues during this critical time.

In 2022, RF continued these state outreach efforts, interacting with the states to provide independent expertise on reliability related topics such as the changing generation mix and transmission planning, resource adequacy, cyber and physical security, resilience, and transmission and distribution system interdependencies. In addition to meeting with state officials throughout the year, RF shared key ERO and RF reports, assessments, and outreach opportunities.

In early 2022, RF CEO Tim Gallagher and NERC CEO Jim Robb presented on national and regional reliability topics to the Indiana State Senate Utilities Committee.

Mr. Gallagher also attended the Organization of PJM States, Inc. (OPSI) annual meeting in Indianapolis in October

and participated in a panel discussion with Mr. Robb and state commissioners and policymakers. The panel focused on resource adequacy, the pace of change, and gas-electric interdependencies.

The state outreach team met regularly with state public utility commissions and legislatures throughout RF's footprint to serve as a resource. For example, the team met with several public utility commissions to discuss battery storage and the evolving technology in that area.

The team also worked to mature the state outreach program's key messages and communication plan, and prioritized outreach based on each state's unique reliability characteristics and legislative activities that could affect the grid.

In 2023, RF will continue to meet with the state public utility commissions, and plans to increase communications with state legislatures and their energy committees. Our activities in this space are rapidly expanding as we see the need for our expertise growing.

If you would like more information on this program, please contact Michelle Cross, RF's Manager of External Affairs (michelle.cross@rfirst.org).

ORGANIZATIONAL ADVANCEMENTS

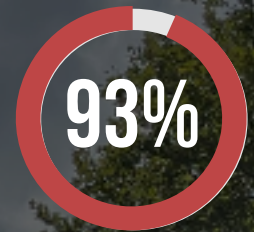
Team Members Added

RF grew by 11 new team members in 2022.



Retention Rate

At RF our employees are our greatest asset. We achieved a 93% retention rate, up 8% from 2021.



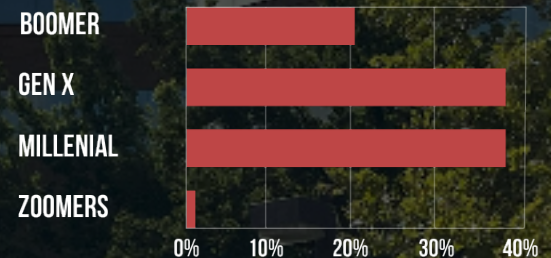
Women in Leadership

RF is proud to have increasing female representation at all levels of leadership roles.



Multi-generational

We have representation from four generations working cohesively together.



Diversity, Equity, and Inclusion

We believe in cultivating a diverse culture to support our mission; one that ensures that employees feel empowered, valued, respected, and engaged. Throughout the year we held twelve different trainings for staff and managers focusing on deepening our knowledge and experiences.



2022 Top Workplace

We are proud to have been named a 2022 Top Workplace by The Plain Dealer and Cleveland.com.



Community Outreach

RF employees care about the communities around them. At our annual Day of Giving, team members worked at four local charities volunteering over 250 hours. In addition, we helped at the Cleveland Food Bank multiple times throughout the year packing almost 1,700 lunches and 400 boxes of non-perishable food.





RELIABILITYFIRST

3 Summit Park Drive, Suite 600
Cleveland, OH 44131

216-503-0600

www.rfirst.org