



Forward Together • ReliabilityFirst

ANNUAL REPORT

2020



RELIABILITY FIRST



Simon Whitelocke
Chair of the Board of Directors

From Our Chair,

The challenges posed over the past year underscore the critical importance of RF's mission of preserving and enhancing the reliability and security of the bulk power system in our footprint. RF staff and registered entities met these challenges in 2020, and on behalf of the board, I thank you for your hard work to keep the grid running during these unprecedented times.

This report discusses the collaboration between FERC, NERC, and the Regions with the industry to implement the appropriate regulatory discretion to ensure both reliability and safety during the pandemic.

It also discusses the accomplishments of RF throughout the past year, and I applaud the staff for continuing to fulfill their responsibilities seamlessly during 2020.

I would like to extend a warm welcome to the new members of the RF Board of Directors and my sincere thanks to those who are departing.

Our new Board members are Jason Marshall, Executive VP, Transmission and Regulatory Affairs at Wabash Valley Power Alliance, Antonio Smythe, Senior VP of Transmission Ventures, Strategy and Policy at AEP, and Rachel Snead, Director of NERC Reliability Compliance & NERC Policy, Electric Transmission for Dominion Energy Virginia. Jason will represent the Small LSE Sector, Antonio will represent the Supplier Sector, and Rachel will represent the Supplier Sector. Lynnae Wilson was reelected to continue representing the Transmission Sector.

We will miss departing members Susan Sosbe, Lou Oberski, and Lisa Barton, and we are grateful for their valued service.

On behalf of RF, thank you to all who worked with us to ensure reliability and security in 2020, including FERC, NERC, our Regional partners, and our entities.

Forward Together,

Simon



RELIABILITY FIRST



Tim Gallagher
President & CEO

From Our President & CEO,

I'd like to start by sending my heartfelt thanks to every one of you working to keep the electric grid safe and reliable during the pandemic. Your efforts play an integral role in helping our country make it through this trying time, and please know that the whole RF team is here to support you. The grid is the backbone of our economy, critical for our national security, and necessary to support public welfare, and I'm prouder than ever to be a part of this industry.

RF's Business Continuity Plan was instituted in early March of 2020 and included switching all in-person meetings and events to web/video format. Decisions like these are not taken lightly, but our top priority is the health and safety of all personnel at RF, our entities, stakeholders, and colleagues across the ERO Enterprise. I'm proud of our staff and our entities, who continued their jobs seamlessly in spite of the challenges presented. It truly exemplifies the resiliency we work so hard to provide for the grid.

We happily welcomed Niki Schaefer back to RF in 2020 as our VP and General Counsel. Niki joining the team allows Rob Eckenrod to focus on his impactful new role of VP, Entity Engagement and Corporate Services.

RF's Senior VP and Treasurer, Ray Palmieri, retired in June 2020. After nearly 50 years of service to the industry, I know many of you worked with Ray, and he has always been known for his positivity, leadership and comradery. His legacy, at RF and throughout the industry, is one that will last for many years to come.

Jeff Mitchell also retired in 2020, and his retirement will be felt deeply by our entire team, as well as many of you who have worked with him. In addition to his previous work at ECAR and stints as chair of the NERC Planning Committee and ERAG, the importance of Jeff's efforts to shine a light on human performance risk and system protection misoperations cannot be overstated.

On behalf of everyone at RF, thank you for continuing to ensure the reliability and security of the bulk power system. This year has been incredibly challenging but also encouraging, as I see our industry meet the challenges we are facing through hard work, ingenuity, and collaboration.

Forward together,

Tim

Ensuring Reliability, Security, and Safety During a Global Pandemic

2020 was a year unlike any other we have witnessed, bringing with it a global pandemic that has affected nearly every aspect of life for Americans and those around the world. In this difficult time, the health and safety of employees and the reliability and security of the bulk power system (BPS) are critically important to the welfare of our entire country.

To ensure the health and safety of our staff and stakeholders, RF instituted our business continuity plan in March. This included the transition to telecommuting and use of video conference calls for entity engagements rather than on-site visits.

We are proud to report that staff and entities rose to the challenges presented in 2020. RF continued to operate seamlessly and accomplish our mission, and entities worked hard to keep their employees safe and continue operating the grid in a reliable and secure manner.

The ERO Enterprise (ERO) participated in regular calls with key government partners, and worked with FERC to provide guidance on regulatory discretion related to certain Standards and Requirements in light of the pandemic. The ERO recognized that entities may need to take unprecedented actions to address COVID-19 impacts, and allowed entities to self-log instances of potential noncompliance related to their COVID-19 response.

We continue facing the challenges of COVID-19 in 2021, and these safety measures and regulatory discretion will remain in place as long as needed. RF is confident that the ERO and the electric industry will remain resilient throughout these difficult times.



2020 Innovation Awards and Retreat

RF hosted its third annual Innovation Awards and Retreat in February 2020. The purpose of this day-long, interactive event is to encourage staff innovators to try new ideas and projects, foster discussion on those projects, and recognize exceptional work. Each year, since we began, the number and scope of the ideas have grown, as well as participation.

The event was held at Topgolf in Cleveland. RF welcomed guests Mark Lauby, Senior Vice President and Chief Reliability Officer at NERC; Lam Chung, Vice President at Midwest Reliability Organization; and RF Board Members Brent Greene and Bob Mattiuz. Additionally, two guest speakers provided insights on emerging trends: Dinesh Kumar, the founder and Chief Technology Officer of Mitovia, Inc., and Dr. Rebecca Slayton, Associate Professor at Cornell University with a specialty in Cybersecurity and Infrastructure.

Two awards were given: one for best Innovation project and one for best Continuous Improvement project. Dwayne Fewless, Principal Analyst on our OAA team, and Sam Ciccone, Senior Reliability Consultant on our Entity Engagement team, won the Innovation Award for the Risk Register project, and Tony Freeman, Principal Analyst on our RAM team, won the 2020 Continuous Improvement Award for the Entity Risk Ranking project.

Risk Register

The **Risk Register** is a list of the risks underlying each NERC Standard and Requirement, along with emerging risks. RF subject matter experts validate and categorize all new risk entries. The Risk Register provides traceability between the risks, the Standards, and internal controls, making it a useful translation tool for auditors, enforcement staff, risk analysts and outreach and training staff.

Entity Risk Ranking Tool

RF is always seeking to better understand and visualize the risk of entities in our region. The **Entity Risk Ranking tool** provides a dashboard which incorporates relevant entity information, allowing a snapshot of each entity. The tool will help RF to make better risk decisions based on the output from IRAs, and facilitate the scoping and scheduling of audits.



Dwayne Fewless,
Winner of 2020
Innovation Award



Sam Ciccone,
Winner of 2020
Innovation Award



Tony Freeman,
Winner of 2020
Continuous
Improvement Award

Cyber Resilience Efforts

Cyber resilience remains a major area of focus to protect against rapidly evolving global threats, and in 2020 RF continued efforts to enhance the resilience of its footprint and the overall power grid. These efforts included further work on the Cyber Resilience Assessment Tool (CRAT) and a new, multi-regional operational resilience Community of Practice.

RF's CRAT is a voluntary self-assessment that allows entities to evaluate and benchmark their cyber resilience posture. The tool is now available to all RF Registered Entities. It has garnered positive feedback regarding creating awareness of factors impacting resilience and identifying opportunities for continuous improvement.

RF also recently initiated an operational resilience community of practice in collaboration with SERC. This group is working with internal and external subject matter experts to derive factors contributing to operational resilience from generation, transmission and extreme weather conditions.

A Focus on Continuous Improvement

RF strives for excellence and efficiency in all we do, and we understand that this requires a dedication to continuous improvement. In 2020, RF established communities of practice focused on increasing knowledge and enhancing our activities related to facilitation and evaluation. In addition to these company-wide communities of practice, the RF program areas also undertook various continuous improvement projects. The following topics provide a snapshot of some of these valuable projects taking place across the company.



Entity Engagement & Corporate Services:

- Supply Chain Self Assessment Tool
- Targeted Outreach Approach
- Enhanced Fraud Program
- Policy and Procedure Enhancements
- Enhanced IT Metrics Tracking
- HR Competency Roadmaps
- Enterprise Risk Management Maturation



Compliance Monitoring & Enforcement:

- Self-Logging/Verification Sampling
- Formalizing and Streamlining Processes
- Work to Implement ERO-Wide Align Tool
- Enhanced Risk Dashboards
- Internal Controls Knowledge Center
- Internal Controls Review During Audits



Reliability & Risk:

- Process Enhancements
- Refining Threats & Vulnerabilities Capabilities
- Enhanced Risk Dashboards
- Development and Use of the Risk Register
- EMS Knowledge Center
- Improved Assessment Reports
- Misoperation Knowledge Center

Risk Identification

The key first step to ensuring reliability is to identify and understand the continually evolving risks facing our BPS. RF's risk identification activities, which inform our work as a Region, are described in the following section.

Inherent Risk Assessments

The Inherent Risk Assessment (IRA) is a process where RF assesses the inherent risk of an entity to the reliability of the BPS. The IRA is used as an input into the Compliance Oversight Plans (COP). RF continued to implement an enhanced COP process that captures how RF will monitor a Registered Entity's compliance with selected NERC Reliability Standards based on entity-specific risks. RF conducted 23 IRAs and enhanced COPs in 2020. The team also continued to use the Entity Profile Questionnaire (EPQ) Tool, a secure tool that consolidates a number of information requests previously issued to entities in connection with the IRA.

Risk-Harm Assessments

During the Risk-Harm Assessment, RF subject matter experts evaluate the risk and potential harm posed by a possible violation. Historically, CIP-004 (Personnel & Training) and CIP-007 (Systems Security Management), which govern high-frequency conduct, have been the most frequently violated Standards in the Region. This trend continued in 2020, as CIP-004, CIP-007, CIP-010 (Configuration Change Management and Vulnerability Assessments), CIP-005 (Electronic Security Perimeters), and CIP-006 (Physical Security of BES Cyber Systems) were the most frequently violated Standards.

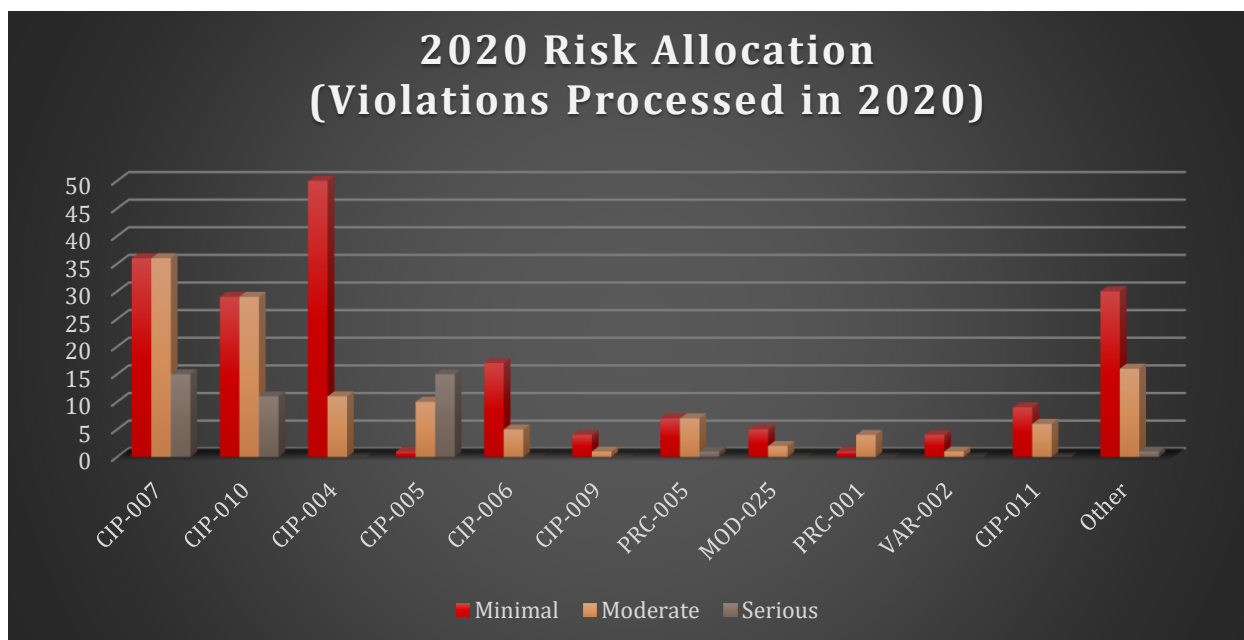


Figure 1: 2020 Risk Allocation of Violations

The most violated Standards in 2020 were CIP-004, CIP-007, CIP-010, CIP-005, and CIP-006, highlighting the continued importance of cyber security efforts.

Operational Analysis & Awareness

In 2020, the Event Analysis & Situational Awareness (EASA) department was renamed as Operational Analysis & Awareness (OAA) as part of RF’s reorganization. The OAA department focuses on Event Analysis, Situational Awareness, Threats & Vulnerabilities, and operational RF/ERO Initiatives. During the Event Analysis process, OAA works with stakeholders to identify and analyze system events, and communicate information and Lessons Learned from these events to the industry. In 2020, OAA completed processing seven open events from 2019, as well as 75 new events that occurred in 2020. For the fifth consecutive year, RF experienced no Category 2 or higher events in its footprint.¹

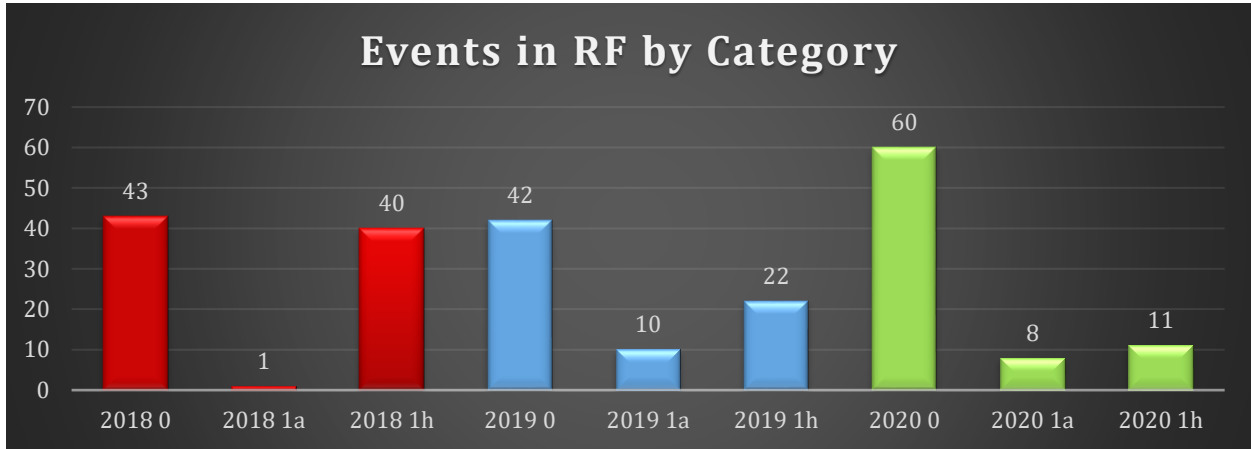


Figure 2: 2018, 2019, and 2020 Events by Category

The RF Region experienced eight Category 1a events in 2020 (an unexpected outage that is contrary to design of three or more BES Facilities caused by a common disturbance). Category definitions are included in the [ERO Event Analysis Process document](#).

Through the EA process in 2020, RF entities shared 60 Category 0 events, an increase from comparable levels in 2018 and 2019. A Category 0 event is a reported event that does not reach any of the category thresholds in the ERO Event Analysis Process. While these events are not typically run through the entire Event Analysis process (i.e. cause-coded), OAA obtains additional detail and performs trending to identify risks and possible Lessons Learned. We are encouraged by our entities’ willingness to continue to share these events. Figure 3 shows the types of Category 0 events submitted to OAA in 2020.

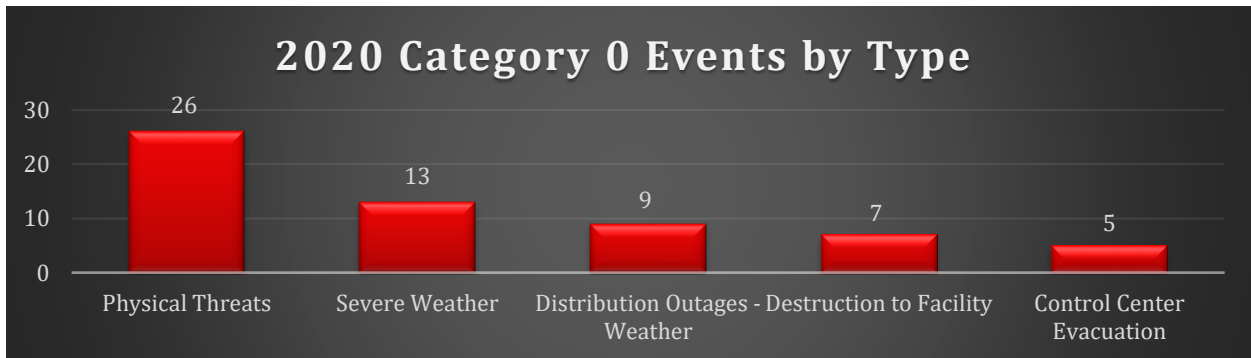


Figure 3: 2020 Category 0 Events (minus EMS related events, shown in Figure 5)

The highest percentage of Category 0 events in the RF Region in 2020 were physical threat-related (typically suspicious activity such as a person approaching or taking pictures of a substation or facility).

In 2020, OAA processed 11 Category 1h events connected to Energy Management System (EMS) issues. This is a decrease from prior years, presumably due to 1) entities being even more vigilant and responsive; 2) faster recovery from EMS outages; 3) OAA’s continuous outreach and engagement; and 4) new EOP-004-4 Reporting Requirements (as of April 1, 2019). Figure 4 provides the themes of EMS events occurring in RF’s footprint in 2020. When comparing the themes from 2019 to 2020, there was a noticeable increase in maintenance related EMS events and a decrease in software related EMS events.

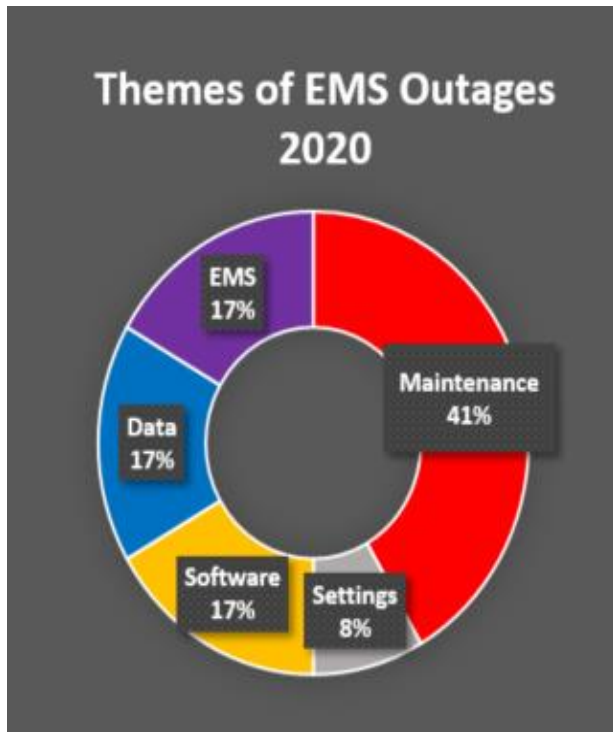


Figure 4: Themes of EMS Outages (2020)

Software: Outages due to a software bug or database issue with the EMS. Sometimes software crashes or fails, and the entity works with the vendor to repair, patch, or fix the software related concern.

Data: Outages due to Real Time Contingency Analysis (RTCA) or State Estimator convergence failures.

EMS: Outages due to a problem with a partial or complete EMS system which caused or contributed to the event; the problem may include but is not limited to design, testing, installation, modification, and troubleshooting.

Maintenance: Any type of change to the EMS system that results in a SCADA, ICCP, or State Estimator outage. These outages are often due to change-management issues.

Setting Issues: Any type of EMS outage due to modifying EMS system settings. Oftentimes settings are adequate upon installation, but due to topology changes or dispatch changes, must be adjusted to help the State Estimator to converge while maintaining a quality solution.

Throughout 2020, OAA worked with NERC in developing Lessons Learned documents. RF created two and contributed to 10 of the 11 Lessons Learned documents published by NERC in 2020. The 2020 Lessons Learned documents are available on the NERC site [here](#).

Other noteworthy OAA activities included ongoing Situational Awareness monitoring and sharing of information; evaluating Threats and Vulnerabilities; engagement in ERO and Industry working group efforts, participating in NERC’s Monitoring and Situational Awareness Technical Conference; supporting FERC and NERC with initiatives on commissioning practices, data verification and validation, and real-time assessments and supporting RF initiatives aimed at evolving the RF Strategic plan and the ERO Transformation.



Engineering and System Performance Activities

As part of RF's reorganization in 2020, the Reliability Assessment and Performance Analysis (RAPA) group was renamed as the Engineering and System Performance (ESP) group. The ESP group is comprised of personnel with transmission planning, protection, and operations experience who perform activities to identify key system risks and engage stakeholders regarding performance, reliability, and resilience improvements. These activities include gathering and reviewing transmission and generation performance metrics, conducting assessments, and facilitating RF's technical stakeholder groups.

System Performance Metrics

ESP coordinates and provides entity support for NERC periodic data requests related to NERC Rules of Procedure (ROP) Section 1600. This includes application support for all xADS tools:

- Misoperation Information Data Analysis System (MIDAS)
- Generator Availability Data System (GADS)
- Transmission Availability Data System (TADS)
- Demand Response Availability Data System (DADS)
- Geomagnetic Disturbance Data System

Seasonal Reliability Assessments

For each upcoming summer and winter season, RF reviews the projected resource adequacy for PJM and MISO, the two Regional Transmission Organizations that operate in the Region. For the 2020 summer season and the 2020/2021 winter season, RF concluded that the Region was projected to have sufficient resources. Additionally, RF conducted confidential summer and winter transmission assessments on the actual operating performance for the 2019 seasons, and the projected operating performance for the 2021 seasons. This included a verification of the power flow models used to perform the transmission assessment studies.

Transmission Reliability Assessments

In 2020, RF conducted four additional nonpublic transmission assessments (listed below) using power flow models created by the Eastern Interconnection Reliability Assessment Group's (ERAG) Multi-Regional Modelling Working Group (MMWG). RF shared these assessment reports with the RF Transmission Performance Subcommittee:

- (1) **Projected 2021 Analysis of Phase Angles:** using a MMWG power flow model representing anticipated 2021 summer conditions, reviewed phase angle differences across open circuit breakers between terminals within the RF footprint.
- (2) **Projected 2024 Near-Term Assessment of Transmission System Performance for P5 Contingencies:** analyzed P5 contingencies concurrent with an N-1 event in the summer MMWG power flow model representing 2024.
- (3) **Projected 2024 Near-Term Assessment of Transmission System Performance for Events Associated with Long Replacement Lead Time Equipment:** analyzed N-3 outages that included one outage of a facility with a long replacement lead-time in the four MMWG power flow models representing 2024.
- (4) **Projected 2024 Assessment of Transmission System Performance for N-3 and Cascading Events:** This series of four assessments summarized a review of the resilience of the Bulk-Power System within

the RF footprint for an advanced look into 2024. This analysis focused on the parts of the transmission system in the New Jersey, Indianapolis, Indiana, Erie, Pennsylvania, and Roanoke, Virginia areas.

Long-Term Resource Assessment

In the annual long-term resource assessment, RF reviews the future demand and capacity resource balance for the Region and analyzes the amount of capacity resource reserves compared to the target reserves. This is done to determine excess or shortage in expected planning reserves for the future summer peak demands. Based on the data for the next 10-year period, PJM meets its reserve margin target through 2030, and MISO meets its reserve margin target through 2023. However, MISO's reserve margin is 479 MW below target for 2024. Continuing in 2025 and beyond, MISO's projected reserve margins are below target, reaching a maximum of 6,991 MW below its target in 2030. MISO and participating stakeholder action is needed to ensure resource adequacy into the future by achieving certainty of prospective resources beginning in 2023. While a four year lead-time should be sufficient to manage these projected issues, RF will continue to monitor this area.

Technical Stakeholder Groups

ESP facilitates various technical forums comprised of industry subject matter experts, which include the following:

- **Reliability Committee (RC)** – This group serves as an advisory body designed to discuss emergent risks, regulatory initiatives, and challenges with the purpose to drive improvement efforts in specialized subcommittee groups.
- **Protection Subcommittee (PS)** – This group is comprised of protection engineers, testing and commissioning engineers, and substation maintenance subject matter experts, and is designed to address any protective relay and control issues (includes both generator and transmission protection).
- **Transmission Performance Subcommittee (TPS)** – This group is comprised of transmission planning engineers and system operators, and is designed to address any transmission planning and/or system performance issues. RF and participating members present nonpublic power-flow analysis, resource adequacy, and post-operational performance results.
- **Generator Subcommittee (GS)** – This group is comprised of generator owners, operators, and compliance representatives and is designed to identify, discuss, and address any generation related issues.
- **Protection Systems Workshop** – This technical workshop is attended by both transmission and generation personnel to discuss risks associated with protection system relay design, maintenance, communication, and performance (i.e., misoperations).
- **Human Performance Workshop and Community of Excellence** – This group discusses safety and performance related risks associated with human performance with a focus on improvement in organizational culture and practices associated with detection, prevention, and mitigation efforts.
- **Substation Maintenance Community of Practice** – This technical peer group is designed to share knowledge related to substation maintenance programs, which includes discussion surrounding best practices and lessons learned.

Risk Mitigation

RF uses various methods to work with industry to help mitigate risks to reliability and security. These methods include compliance monitoring and enforcement, Reliability Standard commenting and development, and registration activities.

Compliance Monitoring Activities

In 2020, RF focused on quickly adapting our compliance monitoring approaches to the challenges presented by COVID-19, while still performing our oversight role. RF collaborated across the ERO, with FERC, and the entities in our footprint to develop new ways of completing engagements while ensuring safety and limiting on-site activity. RF performed 41 Operations & Planning engagements and 21 CIP engagements in 2020, as well as 74 compliance assessment reviews. These engagements were a combination of audits, spot-checks and self-certifications, with the majority performed off-site.

The pandemic required RF to develop new processes and tools to continue performing our oversight as scheduled throughout the year. RF implemented a process that was shared throughout the ERO to perform remote audits of CIP-006 (Cyber Security - Physical Security of BES Cyber Systems), and also utilized video to remotely interview operators. Both are examples of process enhancements that will continue to be useful even after the return to on-site activities. RF also worked with each entity to understand their unique situation and built in flexibility to ensure we had achievable expectations throughout our engagements.

Early in 2020, RF held its first workshop focused on Internal Controls. The one-day event consisted of presentations from RF compliance monitoring staff, presentations from Subject Matter Experts (SME) from various entities discussing their respective organizations' implementation of internal controls, and a panel discussion. It also included an afternoon working session where attendees were seated together based on entity risk to ensure relevant and productive discussions while they built upon their skills using the information they learned in the morning sessions. More than 120 SMEs and Primary Compliance Contacts from 53 different entities attended the event, as well as individuals from four Regional Entities, NERC and FERC.

RF's operations and planning compliance monitoring staff also introduced field walk downs in early 2020. The purpose of these field walk downs is to help address identified ERO-wide FAC-003 and FAC-008 risks, and to assess controls with the SMEs in the field. This has resulted in a collaborative effort in improving the reliability of the BES.

Enforcement Activities

RF is responsible for resolving and enforcing noncompliance using a risk-based approach. This involves assessing the risk of the noncompliance and understanding the root cause (and contributing cause(s)), working with entities to ensure they take steps to remediate the noncompliance and prevent recurrence, and processing the noncompliance through an appropriate resolution based on risk and other factors. In 2020, RF continued to focus its efforts on improving the efficiency of risk-based enforcement practices, including processing lower risk noncompliance through streamlined enforcement processes and otherwise creating efficiencies where possible.

In 2020, RF processed 461 noncompliances (excluding noncompliances where RF was the Affected Regional Entity under the Multi-Regional Registered Entity program). Similar to past years, the majority of these noncompliances were CIP-related and the overwhelming majority were compliance exceptions. Entities self-reported 90% of noncompliances.



Figure 5: 2020 Self-Report/Audit Findings
90% of violations in 2020 were self-reported. This is an increase in self reports from 2019. This indicates that entities are implementing effective detective controls.



Figure 6: CIP vs. Operations & Planning (O&P)
70% of violations concerned the CIP Standards, and 30% concerned the O&P Standards. This is consistent with the CIP vs. O&P breakdown from recent years.

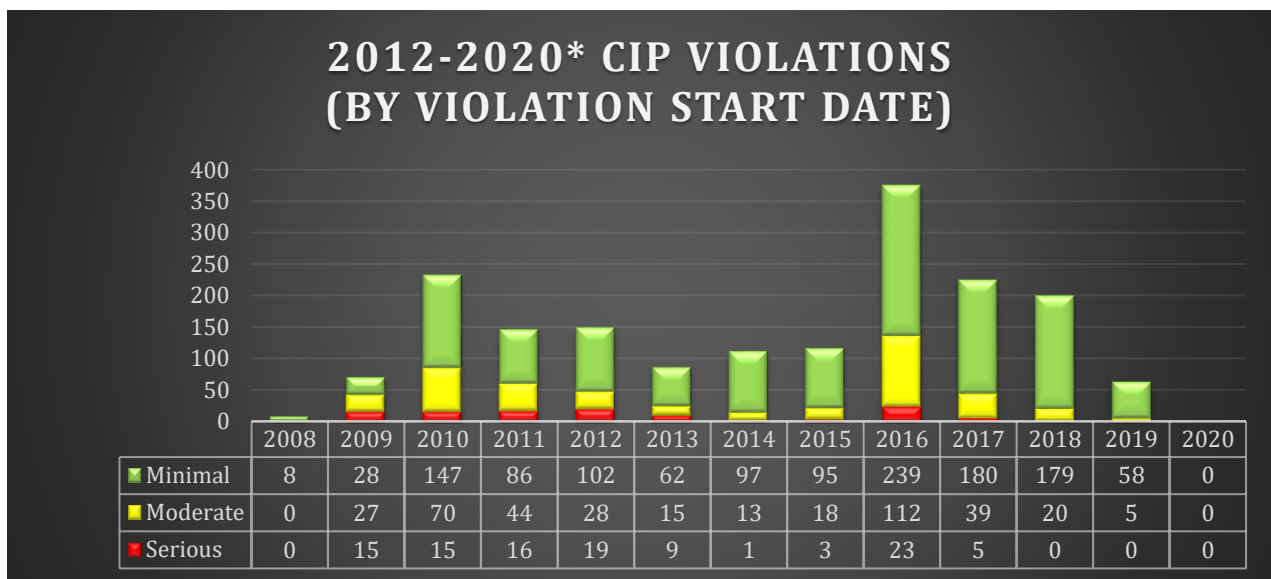


Figure 7: Volume and Severity of CIP Violations over Time
The severity of violations has gone down over time. The total number of CIP violations decreased substantially in 2019. *2020 data is not included, as risk determination for violations that started in 2020 generally takes place in 2021.

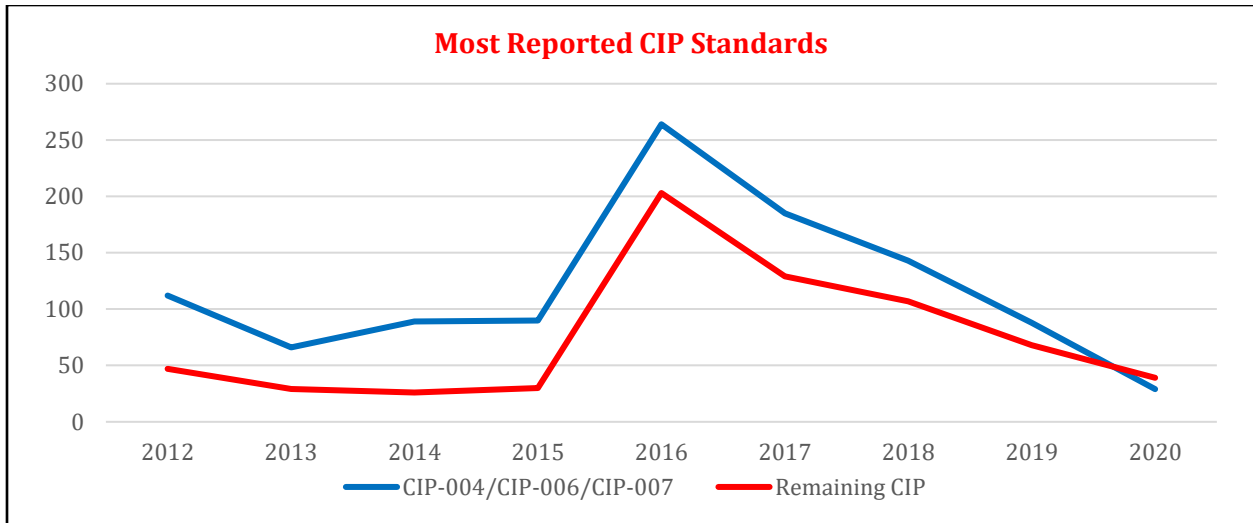


Figure 8: Most Reported CIP Standards

A small number of Standards that govern high frequency conduct (CIP-004, CIP-006, and CIP-007) historically have a greater percentage of violations than the other CIP Standards, and entities should keep a close eye on these areas.

There was an uptick of CIP violations from 2015-2016 (due to the implementation of the CIP Version 5 Standards), which is now back on a downward trajectory.

Standards and Registration Activities

RF provides input during the NERC Reliability Standards development process and maintains regional Reliability Standards as needed, to ensure that Reliability Standards effectively mitigate the risks facing our footprint. In 2020, RF analyzed, voted on, and provided feedback on 33 Reliability Standards.

RF facilitated the registration of 25 new entities on the NERC Compliance Registry and deregistration of 12 entities in 2020. The majority of new registrations involved the Generator Owner/Operator functions, largely driven by an influx of new renewable energy resources (wind, solar, and battery storage). The transfer of generator assets due to larger entities selling, merging, or consolidating assets continues to impact functional registrations across the region. RF also registered three new Transmission Owners, implemented the new Centralized Organization Registration ERO System (CORES) Registration tool, and received and began processing a BES Exception Request.



Risk Communication

It is critical to RF’s mission to effectively communicate identified risks and corresponding mitigation strategies across the industry, to facilitate awareness and continuous improvement. This section discusses RF’s risk communication and outreach efforts that took place over the past year.

Entity Engagement

In 2020, RF’s Entity Development department was renamed as Entity Engagement. This provided an opportunity for RF to define “entity” more broadly for outreach purposes, and identify new ways to reach and engage with that wider audience. RF’s 2020 efforts included outreach utilized in past years such as the Assist Visit Program, Certification Program, Maturity Model Appraisals, newsletters, website content and open calls; as well as new webinars, self-assessment tools, and E-learning modules. RF partnered with other Regional Entities to enhance our outreach and education to positively impact as many stakeholders as possible, including Registered Entities across North America, vendors, and state public utility commissions.

Assist Visit Program

The Assist Visit program remains one of RF’s most popular programs, providing tailored training and information sharing centered on the needs of the entity and key risks they are facing. Due to the pandemic, all Assist Visits after March 2020 were conducted virtually. However, the pandemic did not slow down the number of requests. In 2020, RF performed 70 Assist Visits, shown in Figure 9.

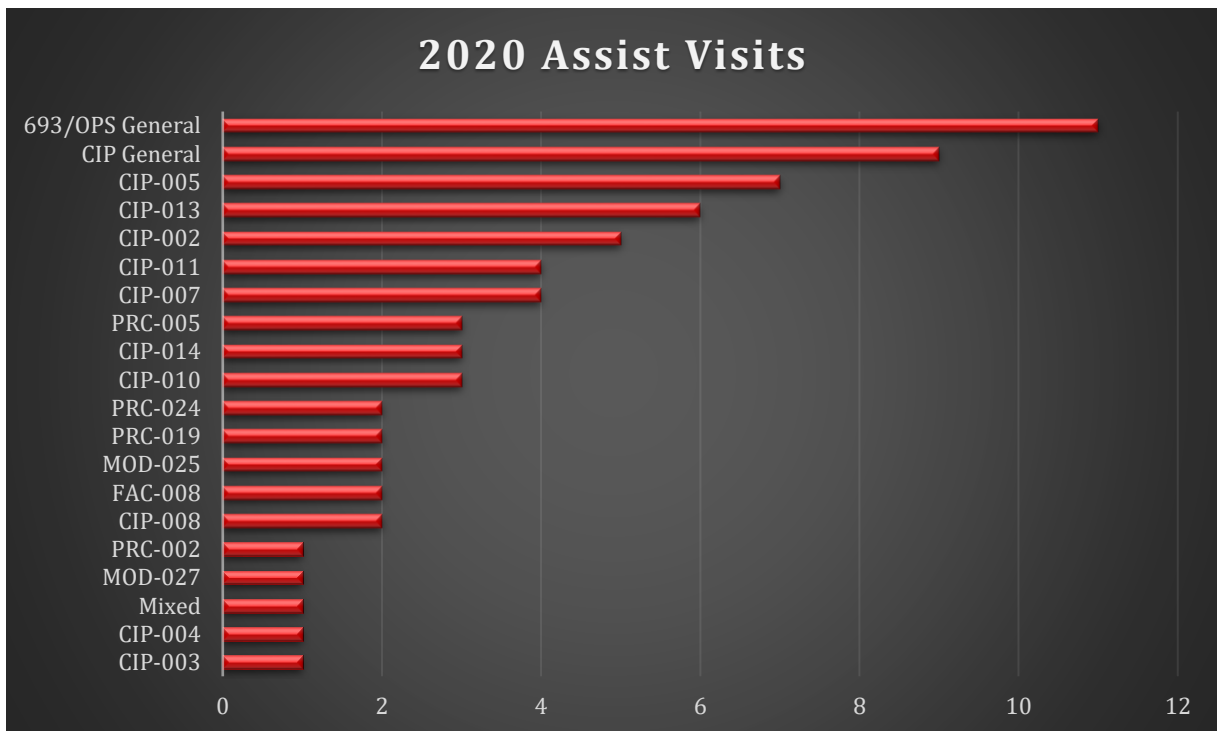


Figure 9: 2020 Assist Visits Breakdown
General CIP and O&P concerns continue to be the two most requested Assist Visit topics. Additionally, Supply Chain (CIP-013) was one of the most frequently discussed topics in 2020 due to the new standard that was enacted October 1, 2020 and the Supply Chain Executive Orders issued September 30, 2020.

Certification and Readiness Reviews

RF performs certification and readiness reviews to ensure that entities experiencing a change in footprint, Energy Management System (EMS) change, or control center relocation are capable of performing the reliability functions of Reliability Coordinator, Balancing Authority, and/or Transmission Operator. In 2020, RF performed three such reviews. Due to the pandemic, these on-site activities became virtual, which allowed the entities to go forward with the necessary changes without introducing additional risk into their control room environment. Using video conferencing, RF was able to conduct interviews remotely, and perform evidence reviews using screen sharing.

Maturity Model Appraisals

Maturity Model Appraisals are engagements offered to enhance an entity's continuous improvement in the management practices areas shown in Figure 10. Using these management practices, an entity can either conduct a self-assessment or work with RF to measure the implementation level of their processes and procedures. This model has been incorporated into the online self-assessment tools offered for free by RF to provide a consistent approach for benchmarking and tracking continuous improvement.



Figure 10: Management Practices

Management Practices help entities identify, assess, and improve the capability to effectively address reliability risks above- and-beyond the minimum levels established by the Reliability Standards. For additional information, contact RF.

Technical Talk with RF

In 2020, the *Reliability and Compliance Open Forum Call* was rebranded as *Technical Talk with RF*. These open calls, typically occurring the third Monday of every month, help RF provide continual outreach on key risk topics such as the pandemic, cyber-security, internal controls, misoperations, resilience, cold weather readiness, transmission planning and modeling, vegetation management and more.

Targeting SMEs through social media, NERC bulletins, and our monthly compliance update letters, RF has increased participation in these calls by 100+%. This outreach also serves as a channel to share new RF tools such as the BES Exercise Master Planner Database, which provides cyber/physical security test cases and injects that stakeholders can utilize to evaluate their incident preparedness, and the Operational Resilience Self-Assessment, which measures entity robustness, redundancy, resourcefulness, and rapidity.

Workshops and Webinars

In 2020, RF explored new ways of interacting with our stakeholders during the pandemic. The Internal Controls Workshop in February (pictured below) was RF’s last in-person event before going virtual. This “working” session provided an opportunity for SMEs to connect and create process flow charts related to their area of expertise (either PRC-004 (misoperation analysis) or CIP-007 (ports and services)). These flow charts were then examined for opportunities to implement new, robust internal controls to help strengthen these processes.

In August, RF hosted its first virtual workshop, which had 575 total attendees from 150 different organizations. This event focused on two major risk topics: Facility Ratings in the morning session, and Supply Chain in the afternoon session.

- The morning session included breakout sessions for large Transmission Owners, Small-Medium Transmission Owners, and Generator Owners to discuss best practices, internal controls, and lessons learned with like-sized entities, similar to the organization of the Internal Controls Workshop. The Facility Ratings program supplemented the one-on-one entity calls that took place throughout the year where RF met with individual entities to discuss the risks and mitigations specific to them.
- The afternoon session included several guest speakers to discuss the vendor perspective on the new Supply Chain Standard (CIP-013). This session also included RF and SERC introducing a new E-Learning module, available online and on-demand, where entities can learn more about risk management and other supply chain related risks.

Also in August, RF virtually hosted its sixth Annual Protection System Workshop, which focused on capacitor bank protection, protection simplicity, and IEC 61850 regarding communications in substations.

RF virtually conducted its third Annual Human Performance Workshop, which focused on the application of human performance techniques and concepts for front-line activities, including operations, asset management, design, protection, and maintenance.

In September, RF hosted its first Insider Threats Webinar, with an exciting agenda of guest speakers from inside and outside industry to dive into the Insider Threat risk topic in detail. In 2021, RF is planning more specific, targeted outreach events such as the Insider Threats webinar to raise awareness and share best practices regarding mitigating risks critical to the BPS and our footprint.



Organizational Advancements

Continually improving RF as an organization is essential to continued success in achieving the mission of ensuring reliability, security and resilience of the electric grid. Each year, a great deal of effort is put into development at both an organizational and individual employee level. A number of key factors contribute to creating a culture that promotes employee engagement, retention and growth – and progress on these factors allows us to serve our entities and stakeholders more effectively.

In addition to the multitude of training opportunities offered to staff, not only to maintain and increase technical knowledge but also to improve professional skills, the following items show a snapshot of RF development efforts in 2020:

- The employee retention rate remained an impressive 98%.
- The potential for career growth was reinforced through 18 internal promotions. With a total of 84 employees, this equates to a notable 21% of the staff.
- The significance of investing in the future of the energy industry was evidenced by bringing in a Data Analytics intern from Baldwin Wallace University, as well as an Engineering intern and two Legal interns from Case Western Reserve University.
- A Diversity and Inclusion (D&I) Community of Practice (CoP) was created to highlight the importance of respecting and celebrating all people and perspectives in the workplace. Through monthly meetings featuring D&I professionals, this CoP encourages staff to expand and develop their knowledge of this critical area of focus.

2020 was the second year RF earned a spot on the Plain Dealer list of Top Workplaces in Northeast Ohio. This accolade is a meaningful reflection of RF's culture that demonstrates staff's dedication and enthusiasm because employee survey results contribute to the decision-making process for this well-known annual award.

Corporate Responsibility through Community Involvement

In 2020, RF continued our efforts to give back to our communities. Despite the limitations posed by the pandemic, groups of RF staff were able to volunteer at the Cleveland Food Bank in September and December, where they packed nearly 12,000 pounds of canned and baked goods.

RF also focused on two giving initiatives during the year: one with the Cleveland Food Bank to help battle food insecurity, and another to provide meals in appreciation for the Cleveland Clinic front line health care workers serving us all in the pandemic.



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