

**UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION**

NORTH AMERICAN ELECTRIC) **Docket No. RR10-1-___**
RELIABILITY CORPORATION) **Docket No. RR13-3-___**

**ANNUAL REPORT
OF THE NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION
ON WIDE-AREA ANALYSIS OF TECHNICAL FEASIBILITY EXCEPTIONS**

The North American Electric Reliability Corporation (“NERC”) hereby provides the 2024 Annual Report on Wide-Area Analysis of Technical Feasibility Exceptions (the “2024 Annual Report”) in compliance with Paragraphs 220 and 221 of the Federal Energy Regulatory Commission’s (“FERC” or “Commission”) Order No. 706¹ and Appendix 4D of the NERC Rules of Procedure (“ROP”). The 2024 Annual Report covers the period from July 1, 2023, through June 30, 2024.

I. BACKGROUND

In Order No. 706, FERC approved eight Critical Infrastructure Protection (“CIP”) Reliability Standards and, among other things, directed NERC to develop a set of conditions or criteria that a registered entity must follow to obtain a Technical Feasibility Exception (“TFE”) from specific requirements in the CIP Reliability Standards.² The Commission stated that the TFE process must include: mitigation steps, a remediation plan, a timeline for eliminating the use of the TFE unless the registered entity provides appropriate justification, regular review of the

¹ *Mandatory Reliability Standards for Critical Infrastructure Protection*, Order No. 706, 122 FERC ¶ 61,040 (2008) [hereinafter Order No. 706], *reh’g. denied*, Order No. 706-A, 123 FERC ¶ 61,174 (2008), *order on clarification*, Order No. 706-B, 126 FERC ¶ 61,229 (2009), *order denying request for clarification*, Order No. 706-C, 127 FERC 61,273 (2009).

² Order No. 706 at P 178.

continued need for the TFE, internal approval by senior managers, and regional approval through the Electric Reliability Organization (“ERO”).³

Order No. 706 also required that NERC submit an annual report to the Commission that provides a wide-area analysis of the use of TFEs and their effect on Bulk-Power System reliability.

The Commission stated:

The annual report must address, at a minimum, the frequency of the use of such provisions, the circumstances or justifications that prompt their use, the interim mitigation measures used to address vulnerabilities, and efforts to eliminate future reliance on the exception.... [T]he report should contain aggregated data with sufficient detail for the Commission to understand the frequency with which specific provisions are being invoked as well as high level data regarding mitigation and remediation plans over time and by region.⁴

In October 2009, NERC filed amendments to its ROP to implement the Commission’s directive in Order No. 706, proposing Section 412 (Requests for Technical Feasibility Exceptions to NERC Critical Infrastructure Protection Reliability Standards)⁵ and Appendix 4D (Procedure for Requesting and Receiving Technical Feasibility Exceptions to NERC Critical Infrastructure Protection Reliability Standards). On January 21, 2010, the Commission approved NERC’s amended ROP.⁶

On April 8, 2013, NERC filed revisions to Appendix 4D of the ROP to streamline the TFE approval process, reflecting NERC, Regional Entity, and industry experience processing TFE

³ *Id.* at P 222.

⁴ *Id.* at PP 220-21.

⁵ The NERC Rules of Procedure, including Section 411, are available at <https://www.nerc.com/AboutNERC/Pages/Rules-of-Procedure.aspx>.

⁶ *N. Am. Elec. Reliability Corp.*, 130 FERC ¶ 61,050 (2010) [hereinafter January 21 Order], *order on compliance*, 133 FERC ¶ 61,008 (2010) [hereinafter October 1 Order], *order on reh’g*, 133 FERC ¶ 61,209 (2010), *order on compliance*, 135 FERC ¶ 61,026 (2011) [hereinafter April 12 Order]. The Commission requested further information and clarification regarding certain aspects of the TFE process. On April 21, 2010, NERC submitted its compliance filing in response to the January 21 Order. On October 1, 2010, the Commission issued an order accepting NERC’s April 2010 filing as partially compliant and directing further changes to the TFE Procedure. *See* October 1 Order. On December 23, 2010, NERC submitted a compliance filing in response to the Commission’s October 1 Order, which the Commission subsequently accepted. *See* April 12 Order.

requests since the inception of the program. On September 3, 2013, FERC approved the proposed revisions and directed limited revisions to Appendix 4D, including modifications to: (1) specify a time frame for reporting Material Changes to TFEs upon identification and discovery; and (2) require the annual TFE report to include information on Material Change Reports and TFE expiration dates.⁷ NERC submitted a compliance filing consistent with the directives from the September 2013 Order, which the Commission approved on January 30, 2014.⁸ Sections 11.2.4 and 13 of Appendix 4D set forth the requirements for the annual TFE report, as modified in accordance with the September 2013 Order.

II. NOTICES AND COMMUNICATIONS

Notices and communications with respect to this filing may be addressed to:⁹

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III. 2024 ANNUAL REPORT

This section provides the TFE information required by Appendix 4D of the ROP. In accordance with Appendix 4D, NERC prepared the 2024 Annual Report in consultation with the

⁷ *N. Am. Elec. Reliability Corp.*, 144 FERC ¶ 61,180 at PP 14, 17-18 (2013) [hereinafter September 2013 Order].

⁸ *N. Am. Elec. Reliability Corp.*, Docket No. RR13-3-001 (Jan. 30, 2014) (delegated letter order).

⁹ Persons to be included on the Commission's service list are identified by an asterisk. NERC respectfully requests a waiver of Rule 203 of the Commission's regulations, 18 C.F.R. § 385.203, to allow the inclusion of more than two persons on the service list in this proceeding.

Regional Entities.¹⁰ NERC used the ERO Enterprise Align Tool (“Align”)¹¹ to gather the majority of the evidence for this report, including the types of Covered Assets for which the Regional Entities have approved TFEs¹² and information on the elements identified in Section 13 of Appendix 4D. NERC compiled and analyzed the TFE data provided by the Regional Entities and Align to prepare the 2024 Annual Report.

For the purposes of this report, any reference to the year 2024 refers to the TFE reporting period between July 1, 2023, and June 30, 2024. For the purposes of demonstrating trends, some figures or tables may refer to previous TFE periods, such as 2022 and 2023, that also refer to the periods of July 1, 2021 - June 30, 2022, and July 1, 2022 - June 30, 2023, respectively.

The transition to the CIP cybersecurity Reliability Standards approved in Order No. 791,¹³ commonly referred to as the CIP version 5 standards, resulted in a significant decrease in the number of TFEs. This decrease has enabled the Regional Entities to better evaluate the risk and impact of TFEs and gain a more complete understanding of the value of the TFE process compared to the administrative burden it places on registered entities and Regional Entities. NERC continues to consider opportunities to modify or eliminate the current TFE process to reduce that burden in two ways. First, Align has normalized the regional TFE tracking and enhances the ability of NERC

¹⁰ The six Regional Entities are (i) Midwest Reliability Organization (“MRO”); (ii) Northeast Power Coordinating Council, Inc. (“NPCC”); (iii) ReliabilityFirst Corporation (“ReliabilityFirst”); (iv) SERC Reliability Corporation (“SERC”); (v) Texas Reliability Entity, Inc. (“Texas RE”); and (vi) Western Electricity Coordinating Council (“WECC”). NERC and the Regional Entities comprise the ERO Enterprise.

¹¹ NERC initiated the Align Project to advance its risk-based posture through platform alignment across NERC and the Regional Entities. Additional information on Align may be found on the initiative webpage, <https://www.nerc.com/ResourceCenter/Pages/Align-SEL.aspx>.

¹² Appendix 2 of the ROP defines the term “Covered Asset” as “any BES Cyber Asset, BES Cyber System, Protected Cyber Asset, Electronic Access Control or Monitoring System, or Physical Access Control System that is subject to” a TFE.

¹³ *Version 5 Critical Infrastructure Protection Reliability Standards*, Order No. 791, 145 FERC ¶ 61,160 (2013) [hereinafter Order No. 791], *order on clarification and reh’g*, Order No. 791-A, 146 FERC ¶ 61,188 (2014).

to monitor and report. Second, the proposed modifications to the CIP Reliability Standards developed during Project 2016-02,¹⁴ which is currently awaiting FERC approval, replaced language triggering TFEs with “per system capability” or removed technical feasibility statements completely.¹⁵

IV. Summary of 2024 TFE Data

The following is the summary of the TFE data reported by each Regional Entity for the elements identified in Section 13.1 of Appendix 4D:¹⁶

1. Frequency of use of the TFE Request process

The frequency of use of the TFE Request process, disaggregated by Regional Entity and in the aggregate for the United States and for the jurisdictions of other Applicable Governmental Authorities, including (A) the numbers of TFE Requests that have been submitted and approved/disapproved during the preceding year and cumulatively since the effective date of this Appendix, (B) the numbers of unique Covered Assets for which TFEs have been approved, (C) the numbers of approved TFEs that are still in effect as of on or about the date of the Annual Report; (D) the numbers of approved TFEs that reached their TFE Expiration Dates or were terminated during the preceding year; and (E) the numbers of approved TFEs that are scheduled to reach their TFE Expiration Dates during the ensuing year.

The data from this reporting period indicates that the number of registered entities that are engaging in the TFE program remains stable from prior reporting years. Figure 1 shows a breakdown of the number of registered entities with approved TFEs within each region. There are 94 total registered entities with approved TFEs across the ERO Enterprise. After correcting for a

¹⁴ Project 2016-02 Modifications to CIP Standards was adopted by the NERC Board of Trustees on May 9, 2024. Additional information on Project 2016-02 may be found on the project site, <https://www.nerc.com/pa/Stand/Pages/Project%202016-02%20Modifications%20to%20CIP%20Standards.aspx>.

¹⁵ See *Petition of the North American Electric Reliability Corporation for Approval of Critical Infrastructure Protection Reliability Standards*, Docket No. RM24-8-000 (July 10, 2024) at 29-30 (stating that “the proposed revisions use the term ‘per system capability’ to account for the different types of technology that will be expected to meet the security objective. With the use of this language, Responsible Entities will continue to be responsible for implementing an equally effective method, if necessary and capable, to meet the ultimate security objective for each requirement where this language appears.”).

¹⁶ Unless stated otherwise, a table or reference to “2023” refers to the reporting period for this report: July 1, 2022 – June 30, 2023.

miscount in SERC from 2023, the number of registered entities with approved TFEs has decreased by one from 2023 to 2024. This miscount was due to an entity being counted as one entity, when it was four separate entities. This particular entity was part of a Coordinated Oversight Group, and the names of the unique registrations in the NERC Compliance Registry (NCRs) are similar, which caused the undercount. Texas RE has the least registered entities with approved TFEs at seven and WECC has the most registered entities with approved TFEs at 27.

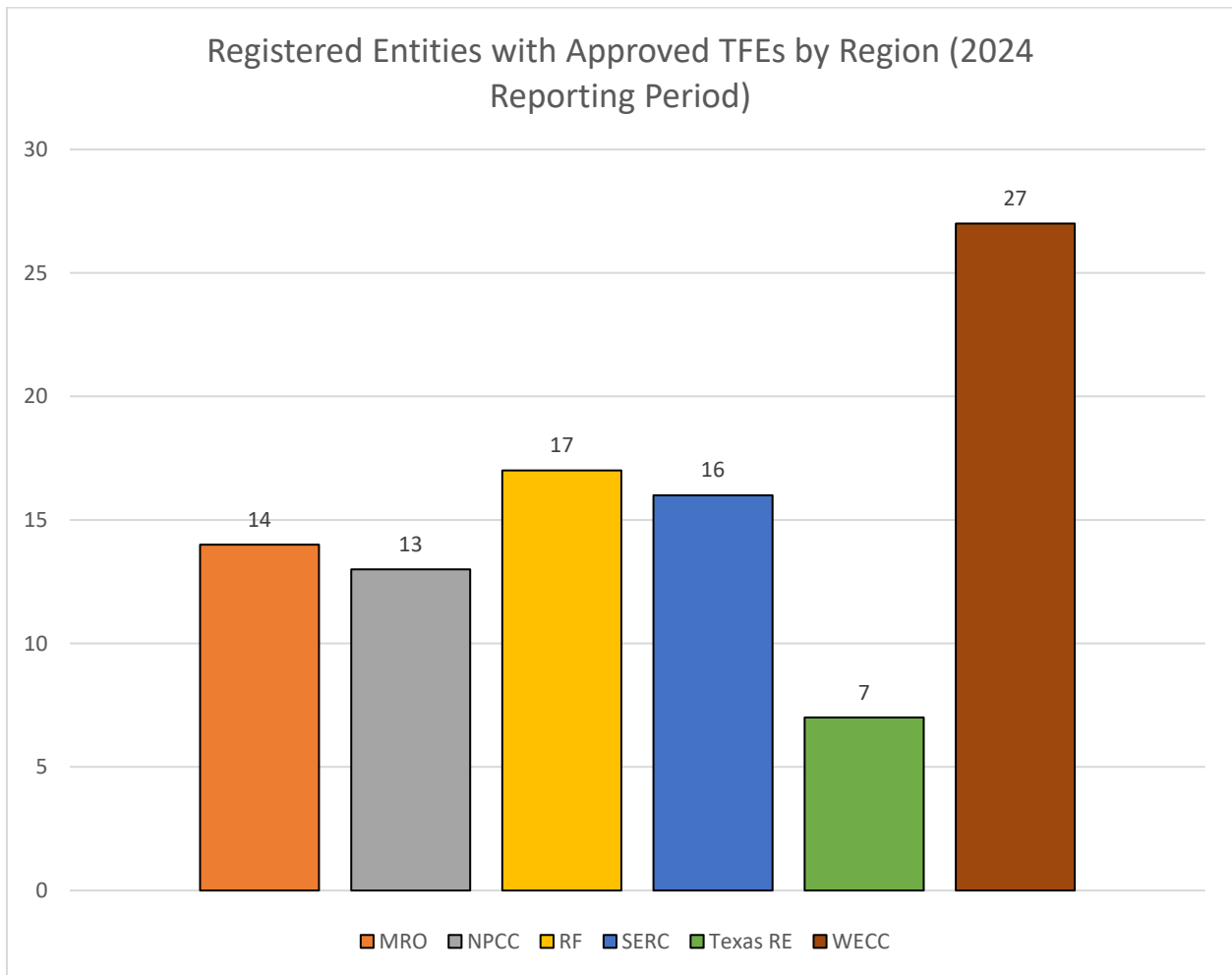


Figure 1: Number of Registered Entities by Region with Approved TFEs as of 6/30/2024

Table 1 below shows the number of registered entities with approved TFEs in 2022, 2023 and 2024 for comparison. The table also includes an analysis of the change between 2023 and 2024. The overall number of registered entities with approved TFEs has remained relatively

consistent over the past three reporting periods, fluctuating between 94 (2024) and 95 (2022 and 2023) registered entities with TFEs. Among all six Regional Entities, the ERO Enterprise saw a small net reduction of registered entities with approved TFEs, with SERC gaining one entity and RF and WECC removing one entity each.

	MRO	NPCC	RF	SERC	Texas RE	WECC	ERO Enterprise
2022 Reporting Period	14	13	20	15	6	27	95
2023 Reporting Period	14	13	18	15*	7	28	95
2024 Reporting Period	14	13	17	16	7	27	94
Change (2023 – 2024)	0	0	-1	1	0	-1	-1

*This number was lower in the 2023 Annual Report due to an error when counting four separate entities as one. This was previously reported as 12 but was 15.

Table 1: Comparison of Registered Entities with Approved TFEs (2022-2024)

Figure 2 is a graphical representation of the data displayed in Table 1 and is provided to show the changes that have occurred over the last three reporting cycles.

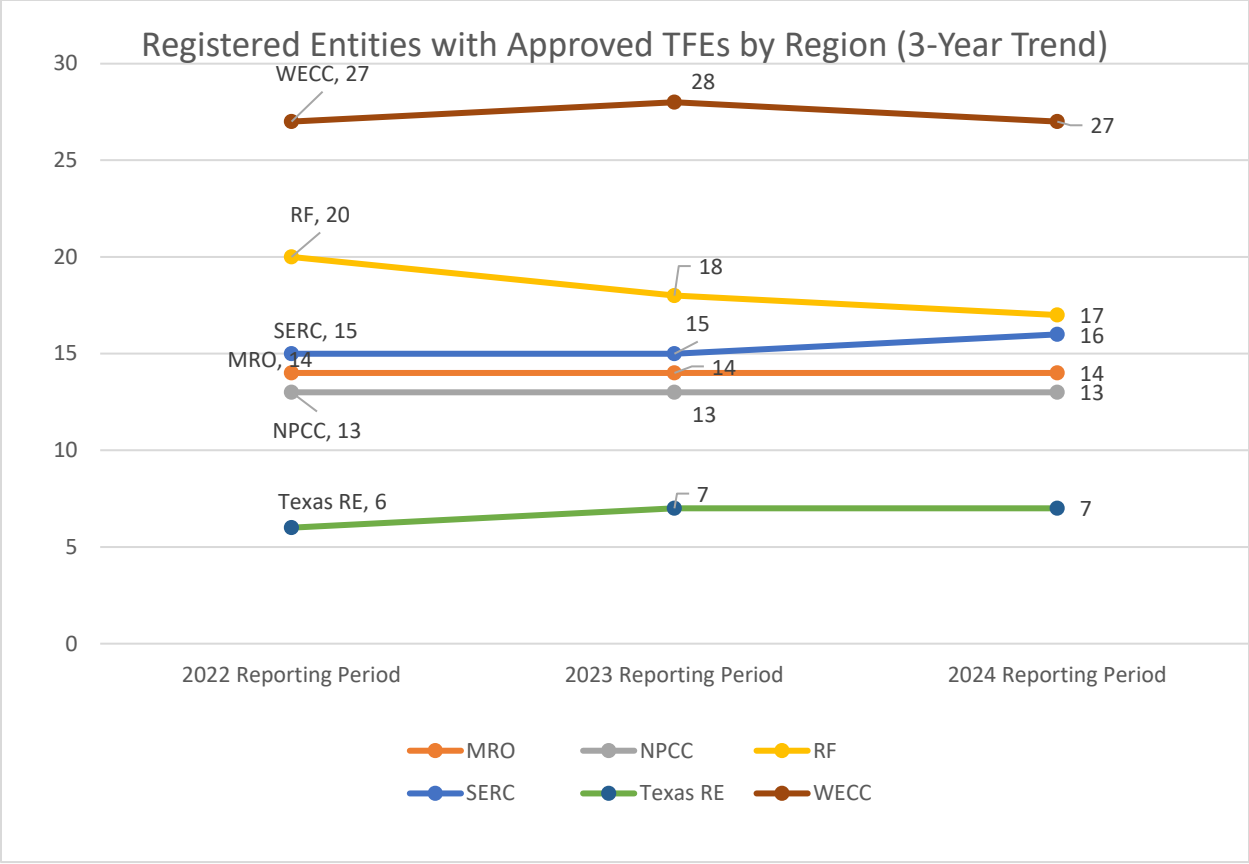


Figure 2: Three Year Trend of Registered Entities with Approved TFEs

Figure 3 visualizes data on the use of the TFE program for the last three reporting periods. The first set of columns in Figure 3 shows the number of registered entities subject to the CIP Reliability Standards. The CIP Reliability Standards apply to the registered entities designated in Applicability Section 4.1 of CIP-002-5.1a through CIP-014-3 (e.g., Balancing Authority, certain Distribution Providers, etc.). From an industry-wide perspective, the number of “CIP applicable” entities in the U.S. (i.e., with registrations to which the CIP Reliability Standards apply) has increased from 1674 to 1725. This is due to the increase in registrations for Generator Owner (“GO”) and Generator Operator (“GOP”) entities.

The second set of columns in Figure 3 depicts the number of CIP applicable registered entities (i.e., those listed in the first column) that report having high or medium impact Bulk Electric System (“BES”) Cyber Systems.¹⁷ There has been a slight decrease in the number of entities claiming to have high or medium impact BES Cyber Systems. In 2023, there were 274 such entities and in 2024 there are 270. Both NPCC and WECC had increases in the number of entities that claim these types of BES Cyber Systems, which is to be expected with the growth seen in the number of CIP applicable entities. RF saw a moderate decrease, which can be attributed to an issue with RF’s method for maintaining counts of entities. This method was reporting an incorrect total of entities claiming to have high or medium impact BES Cyber Systems. RF became aware of this issue when a new repository for tracking high and medium impact systems was implemented and corrected its method. The previous method was counting some entities twice.

The third set of columns in Figure 3 shows the number of registered entities that have approved TFEs. The deviation of 1.05% from 2023 to 2024 indicates that the industry had little change over the last year in the number of entities with approved TFEs.

¹⁷ During the reporting period, only requirements applicable to high and medium impact BES Cyber Systems were subject to TFEs.

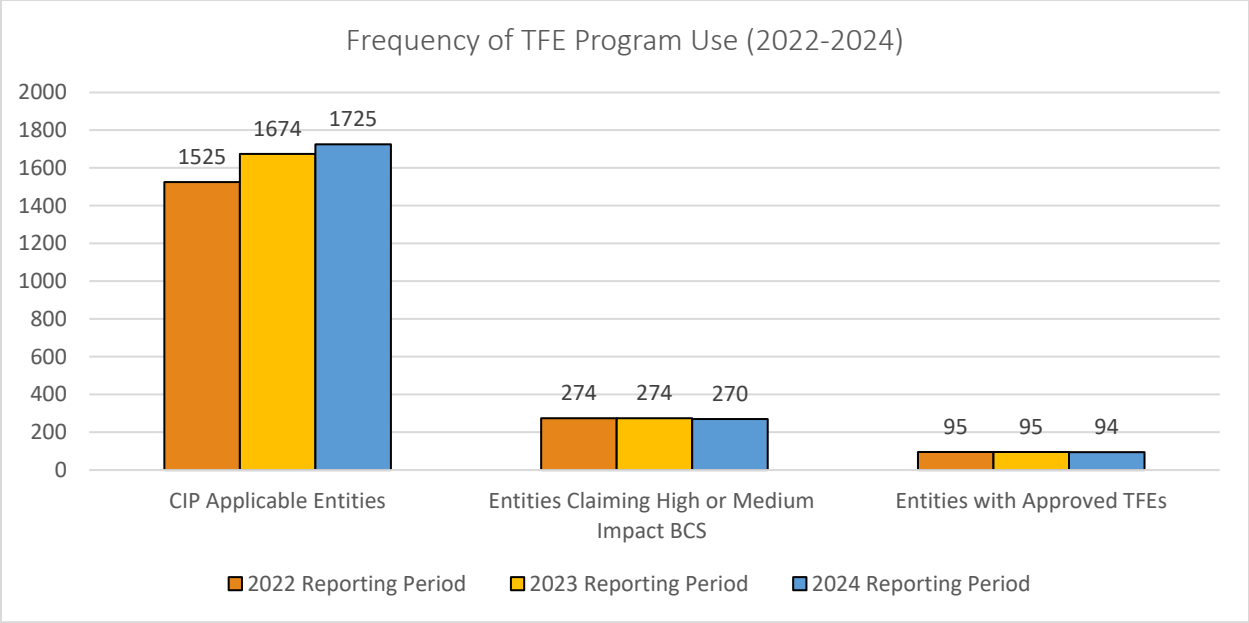


Figure 3: Frequency of TFE Program Use (3-Year Trend)

Table 2 shows a comparison of the number of registered entities claiming high or medium impact BES Cyber Systems. The table also accounts for correcting the issue with RF’s previous method for maintaining counts of entities that was counting some entities twice.

	MRO	NPCC	RF	SERC	Texas RE	WECC	ERO Enterprise
2023 Reporting Period	49	34	56	41	36	58	274
2024 Reporting Period	49	41	44	41	36	59	270
Change (2023-2024)	0	7	-12	0	0	1	-4

Table 2: Comparison of Registered Entities Claiming High or Medium Impact BES Cyber Systems.

Figure 4 depicts the percentage of CIP applicable registered entities with TFE activity (e.g., submissions of new requests, amendments, terminations, etc.) in the 2022, 2023, and 2024 reporting years. The numbers demonstrate a decrease in percentage of TFE activity, dropping from an ERO-wide average of 2.21% to 1.80%. MRO, RF, and Texas RE saw decreases in TFE activity, while NPCC, SERC, and WECC saw slightly increased activity. None of these changes are out of the ordinary as these numbers typically

fluctuate based on increases or decreases in the number of CIP Applicable Entities and how much activity occurs during the TFE Reporting Period.

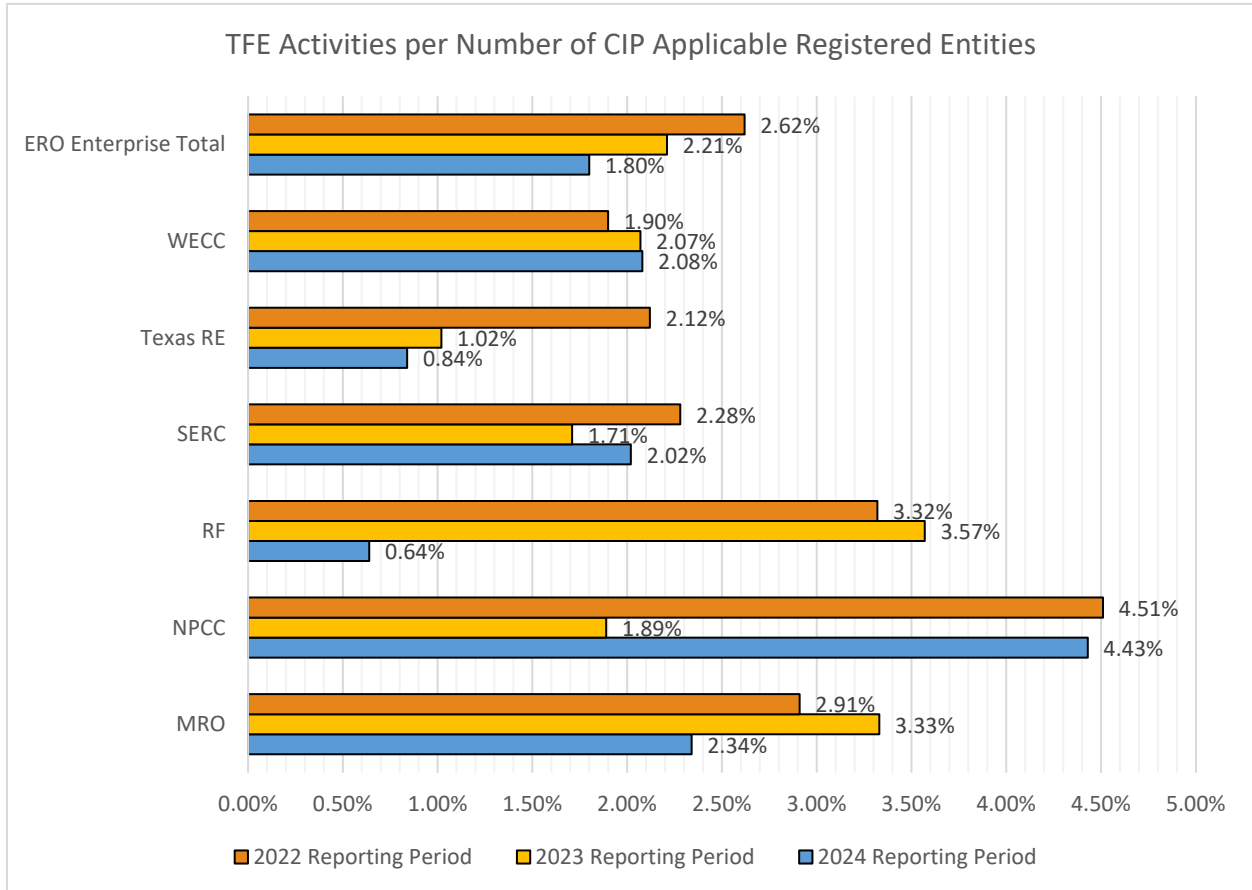


Figure 4: TFE Activities per Number of CIP Applicable Registered Entities

Figure 5 depicts TFE activity by comparing the number of TFE “transactions” (submittals, modifications, terminations, etc.) to the number of registered entities with high or medium impact BES Cyber Systems. From 2022 to 2023, there was a slight decrease in overall TFE activity across the ERO Enterprise. From 2023 to 2024, there was a slight decrease in activity overall of 2.02%, with NPCC and SERC reporting increased activity. The decrease in activity is due to the decrease

in the number of registered entities with TFE activity from 37 entities in 2023 to 31 entities in 2024.

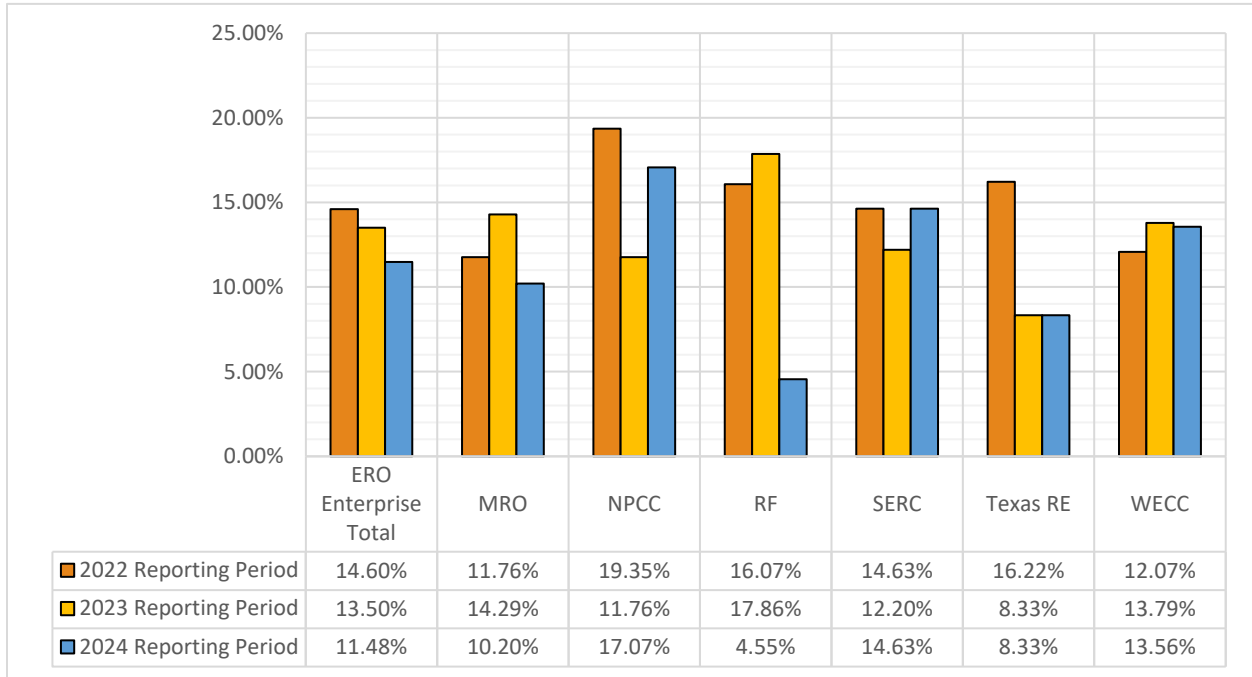


Figure 5: TFE Activity Compared to the Number of Registered Entities with High or Medium Impact BES Cyber Systems

Figure 6 depicts the percentage of registered entities with approved TFEs that had TFE program activity.¹⁸ This percentage across the ERO Enterprise has decreased over the last three reporting years (2022-2024), although it has increased for NPCC, SERC, and WECC. This is due to more entities in NPCC and SERC having activity in 2024 when compared to 2023, while the number of entities with approved TFEs remained the same. In WECC, the number of entities with approved TFEs decreased while the activity remained the same, leading to a slight increase in the percentage. RF showed the largest change (-43.8%) over the last reporting period due to a significant reduction in the amount of activity in 2024. This change is attributed to a reduction in the number of Material Change Requests (“MCRs”) in the RF region. In 2023, there were 19 MCRs compared to 4 in 2024. In addition, the entities who requested these changes reduced from 10 in 2023 to 2 in 2024.

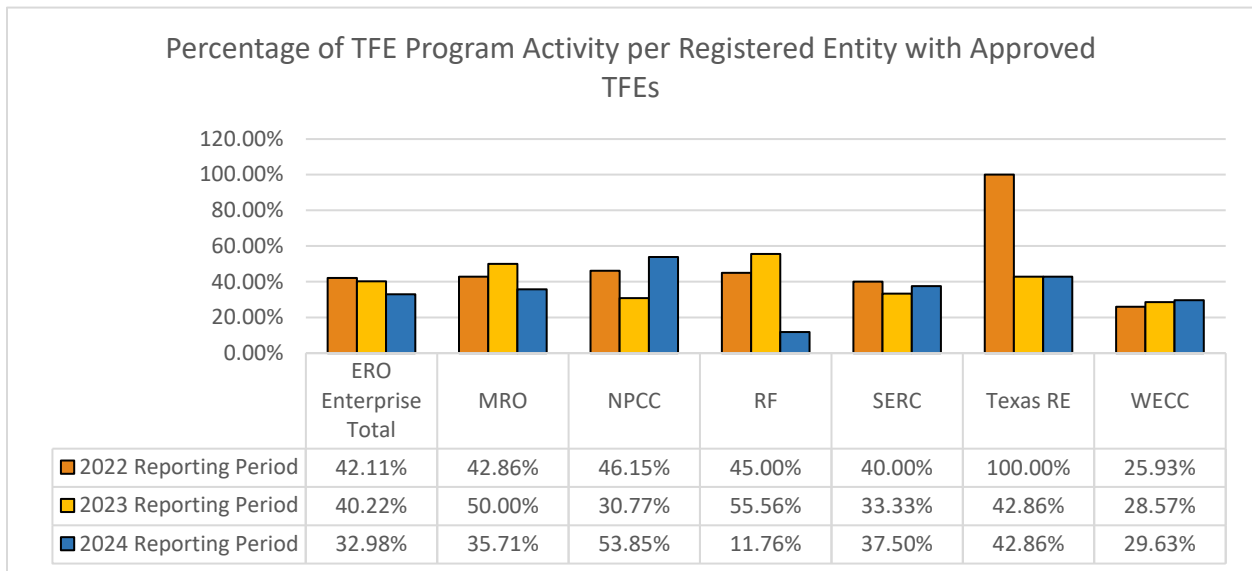


Figure 6: Percentage of TFE Program Activity per Registered Entity with Approved TFEs

¹⁸ TFE activity includes approvals, disapprovals, terminations, and amendments.

Table 3 shows the number of entities that had TFE activity compared to the number of entities with approved TFEs in 2023 and Table 4 shows the same for 2024. These tables are intended to provide a comparison of the two years to help explain the percentages depicted in Figure 6.

	MRO	NPCC	RF	SERC	Texas RE	WECC	ERO Enterprise
2023 Activity	7	4	10	5	3	8	37
2023 Entities with Approved TFEs	14	13	18	15	7	28	95

Table 3: Registered Entities with Activity vs. Registered Entities with Approved TFEs (2023)

	MRO	NPCC	RF	SERC	Texas RE	WECC	ERO Enterprise
2024 Activity	5	7	2	6	3	8	37
2024 Entities with Approved TFEs	14	13	17	16	7	27	94

Table 4: Registered Entities with Activity vs. Registered Entities with Approved TFEs (2024)

It should be noted that there are less than 20 registered entities with approved TFEs in each region, except for WECC. Accordingly, minor changes in activity or the number of entities with approved TFEs can cause larger shifts in the percentages reported. For example, Texas RE has only seven entities with approved TFEs. Texas RE has the least registered entities with approved TFEs compared to all other Regional Entities lead, so any change in activity will have a significant impact as seen by the 57.14% reduction in activity from 2022 to 2023. Overall, the ERO Enterprise experienced a 7.24% decrease due to the decreased number of registered entities with TFE program activity in MRO and RF.

Figure 7 depicts the percentage of registered entities with TFE program activity in 2024, compared to the number of total approved TFEs in 2024. It should be noted percentages are calculated by taking the number of registered entities with TFE activity and dividing it by the number of total approved TFEs in 2024 from each region. Percentages of 100% or higher imply that the number of entities with TFE activity was higher than the number approved TFEs at the

end of the reporting year. For example, in 2022 Texas RE had all entities in the region report some kind of activity. In years past, there have been percentages over 100% which imply there were more entities that requested, terminated, or modified TFEs than there were approved TFEs at the end of the reporting year. Percentages over 100% are only possible if there has been a reduction in the number of approved TFEs compared to the previous reporting period, as the termination of their previously approved TFEs count as activity but they no longer count as an entity with approved TFEs. Overall, the ERO Enterprise noticed a 19.94% decrease in activity. This decrease was due to all Regions, except for NPCC, seeing decreases as there were either more approved TFEs in comparison to the number of registered entities that had activity or fewer entities that had activity overall. NPCC increased due to more entities with activity and about the same number of approved TFEs in the reporting period when compared to 2023.

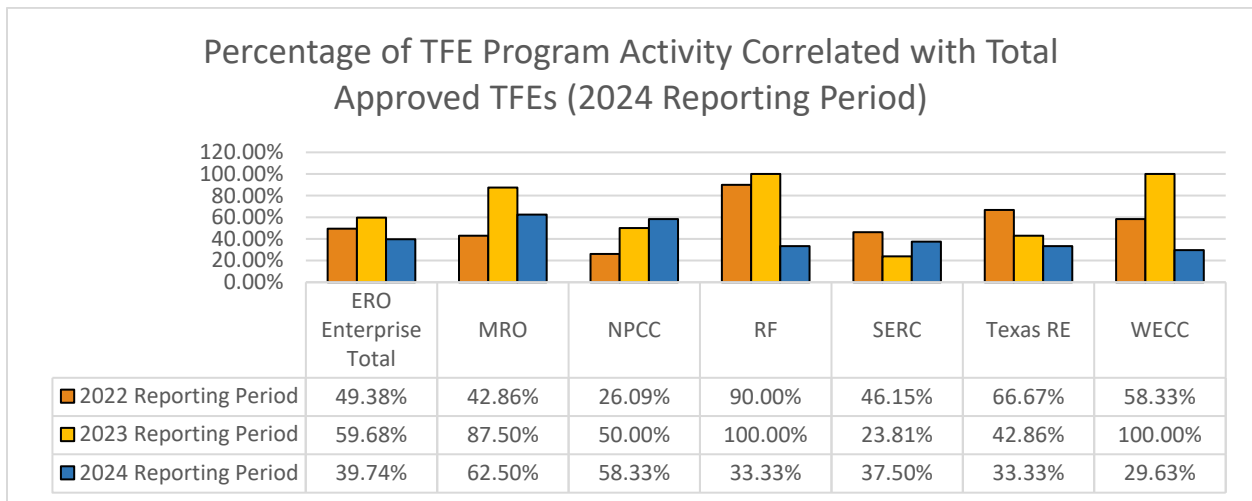


Figure 7: Percentage of TFE Program Activity Correlated with Total Approved TFEs

Figure 8¹⁹ demonstrates how many of the 329 ERO Enterprise-approved TFEs were approved prior to 2024 and how many were approved during the 2024 reporting period, specific

¹⁹ Percentages in Figure 8 were rounded to nearest whole number.

to each Regional Entity. The number of approved TFEs includes both new TFEs and modified TFEs (i.e., MCRs). For instance, the MRO region maintained 25 active TFEs approved prior to 2024 but added or changed 8, bringing the new total to 33, representing 24% of MRO's active TFEs. Registered entities in WECC continue to maintain the most total approved TFEs across the Regional Entities, while Texas RE continues to contain the least. Overall, there has been no change in the number of approved TFEs in the ERO Enterprise from 2023 to 2024. [Table 5](#) shows the breakdown by region for the total number of approved TFEs in the 2023 and 2024 reporting periods. NPCC saw the largest decrease in approved TFEs which were related to a significant number of terminations across two entities, while WECC saw the largest increase due to several TFE approvals for one entity. These approvals were in response to mitigation actions related to an Open Enforcement Action for this entity. These approvals were originally submitted in 2023 but not approved until 2024, contributing to the increase in approvals from 62 in 2023 to 78 in 2024. The original submissions for approval of these TFEs are considered as TFE activity for 2023, but the approvals are considered as 2024 TFE approvals. This also explains why there was less reported activity of both new and modified TFE requests in 2024 compared to 2023.²⁰

²⁰ *See supra* Figure 7 (showing more TFE activity in 2023 than in 2024).

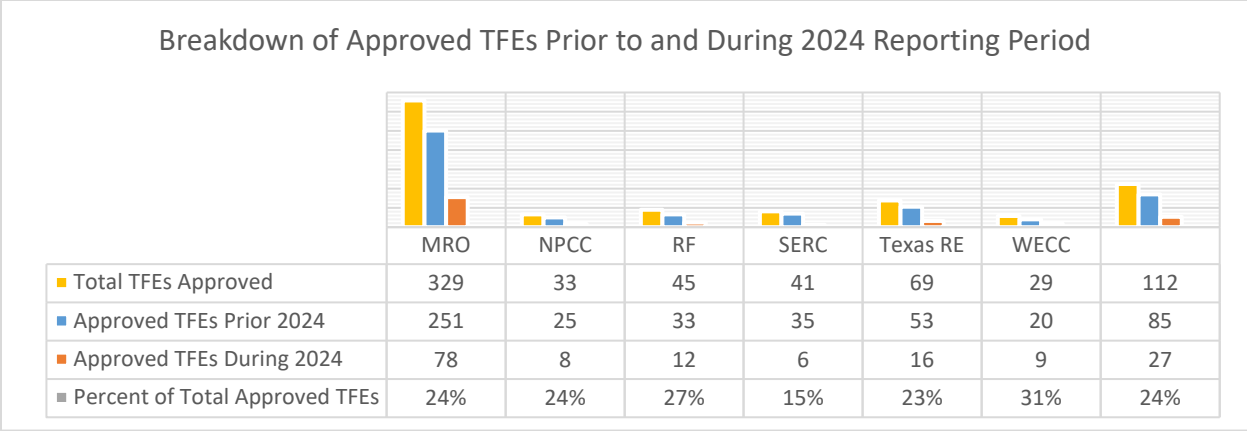


Figure 8: Total Number of Approved TFEs

	MRO	NPCC	RF	SERC	Texas RE	WECC	ERO Enterprise
2023 Reporting Period	35	49	53	69	25	98	329
2024 Reporting Period	33	45	41	69	29	112	329
Change (2023-2024)	0	-4	-12	0	4	14	0

Table 5: Total Approved TFEs by Region (2023-2024)

Figure 9 shows a breakdown of approvals for initial TFE requests and amendments. There were a total of 31 initial TFE requests and 47 amendments approved during 2024. It should be noted that this total includes several initial TFEs and amendments which were requested in 2023 but not approved until 2024. Initial TFEs and amendments that were requested in 2023 are not included in the analysis in the next section. Overall, 39.7% of requests were for new TFEs, and 60.3% of requests were for amendments to existing TFEs.

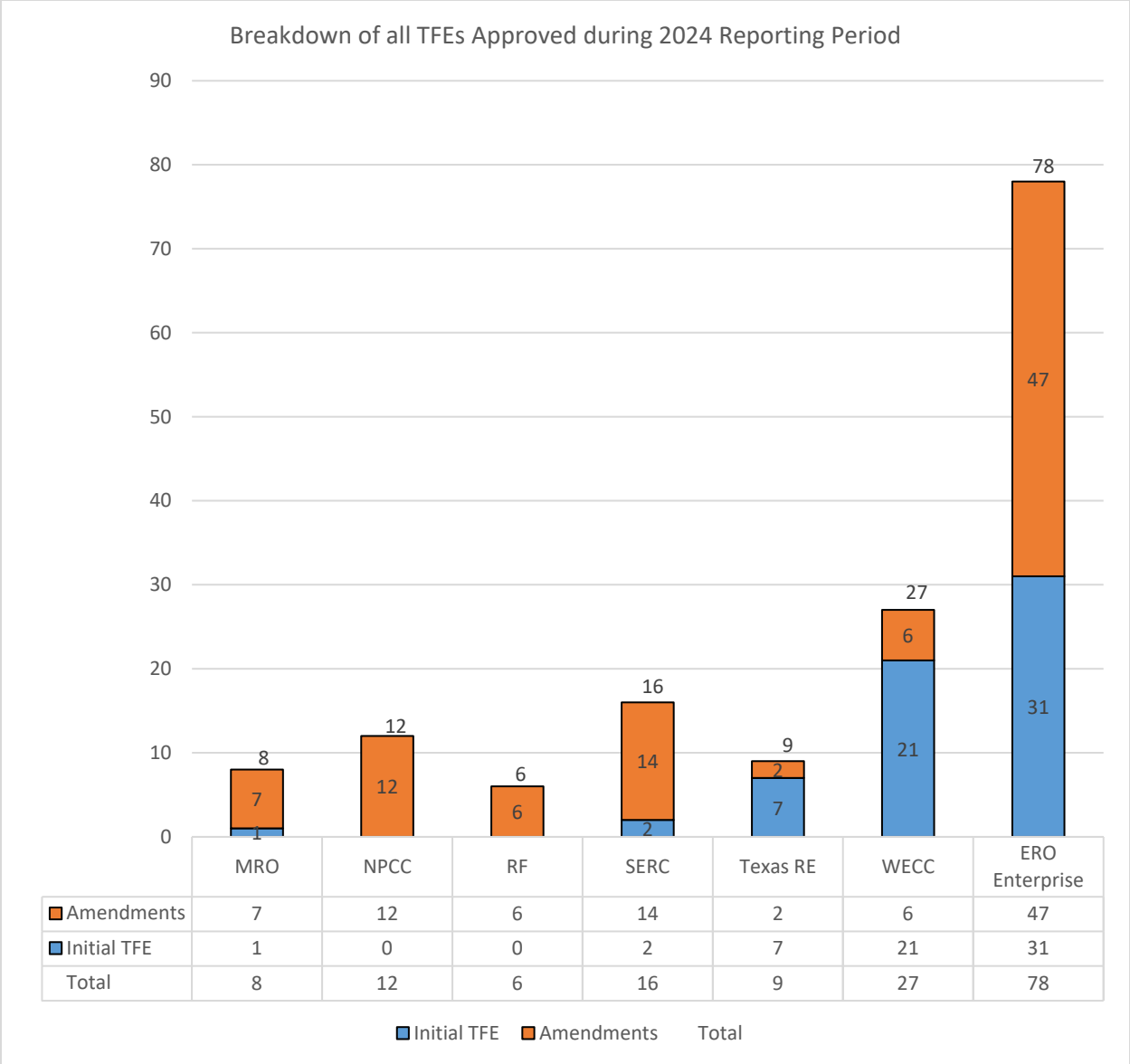


Figure 9: Breakdown of all TFEs Approved during 2024 Reporting Period (includes approvals for requests that spanned multiple reporting periods)

Registered entities submitted 55 TFE amendments in 2024, which was a notable decrease from the 94 seen in 2023. This decrease was due to a large number of MCRs submitted at the end of 2023 for several entities. In 2023 there were a few entities which had a large number of amendments. These were due to minor changes in asset counts. It should be noted that the number of amendments typically fluctuates year over year based on factors such as products no longer

being supported by the vendor and lifecycle replacements. The ERO Enterprise noted 44 of the TFE amendments submitted in 2024 were approved, five were disapproved, and six remain in review as of the end of the reporting period. Most of these amendments were adjustments to the counts of assets covered by the TFEs. The most common reason was due to lifecycle replacements reducing the number of covered assets. Figure 10 provides a breakdown of that activity by Regional Entity during the 2024 reporting period. There were three amendments under review in WECC, two in MRO, and one in NPCC as of June 30, 2024. As shown below, Regional Entities approved many of the amendments submitted, with RF (1), SERC (2), and WECC (2) having disapproved amendments in 2024.²¹

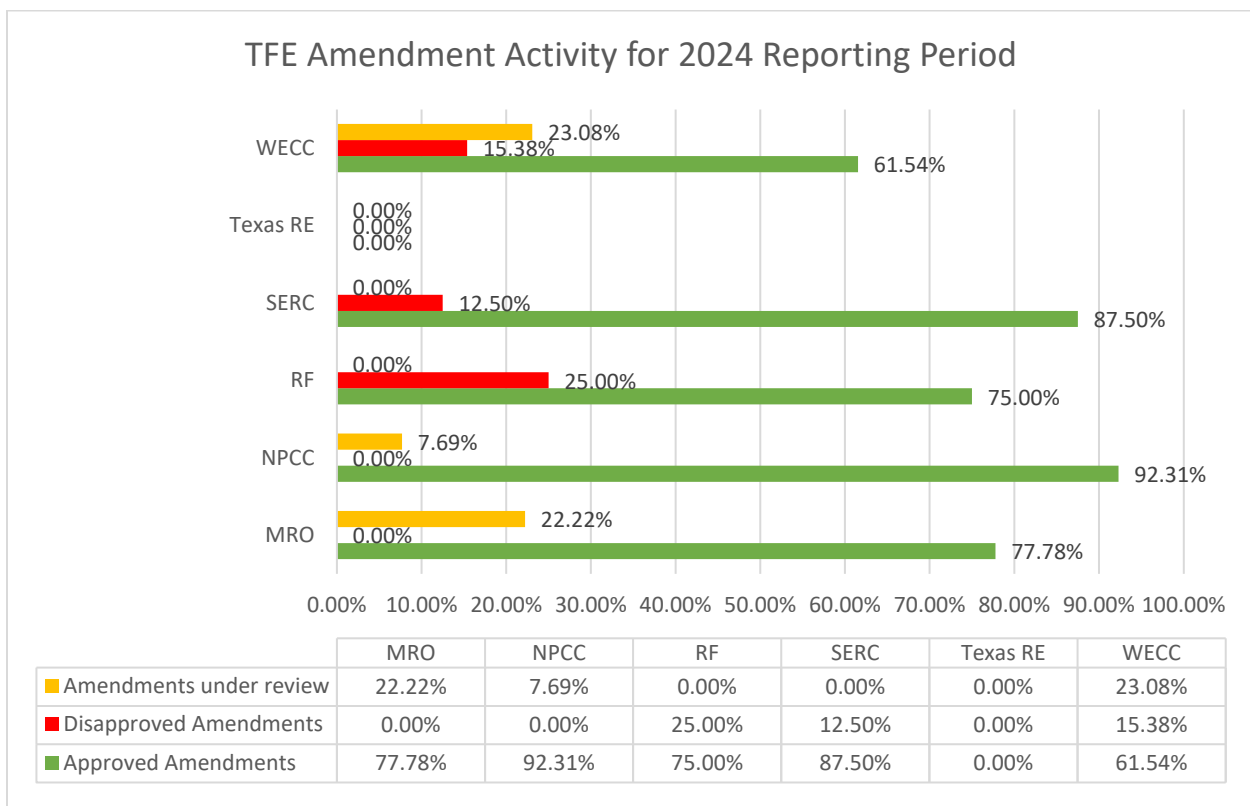


Figure 10: TFE Amendment Activity for the 2024 Reporting Period

²¹ NERC notes that some amendments approved during this reporting period originated from a previous reporting period.

Figure 11 depicts the minimum, mean, median, and maximum quantity of TFEs for each registered entity with an approved TFE as of June 30, 2024. As shown below, the ERO Enterprise mean is 3.48 approved TFEs per registered entity (slightly less than the 3.80 mean average in 2023). The minimum quantity of TFEs a single registered entity has is one TFE in five of the six Regions. The maximum quantity of TFEs a single registered entity has is 25 in SERC. SERC is the region with the highest mean at 4.31 approved TFEs per registered entity, and RF has the lowest mean at 2.41 approved TFEs per registered entity. These statistics only account for registered entities that have approved TFEs.

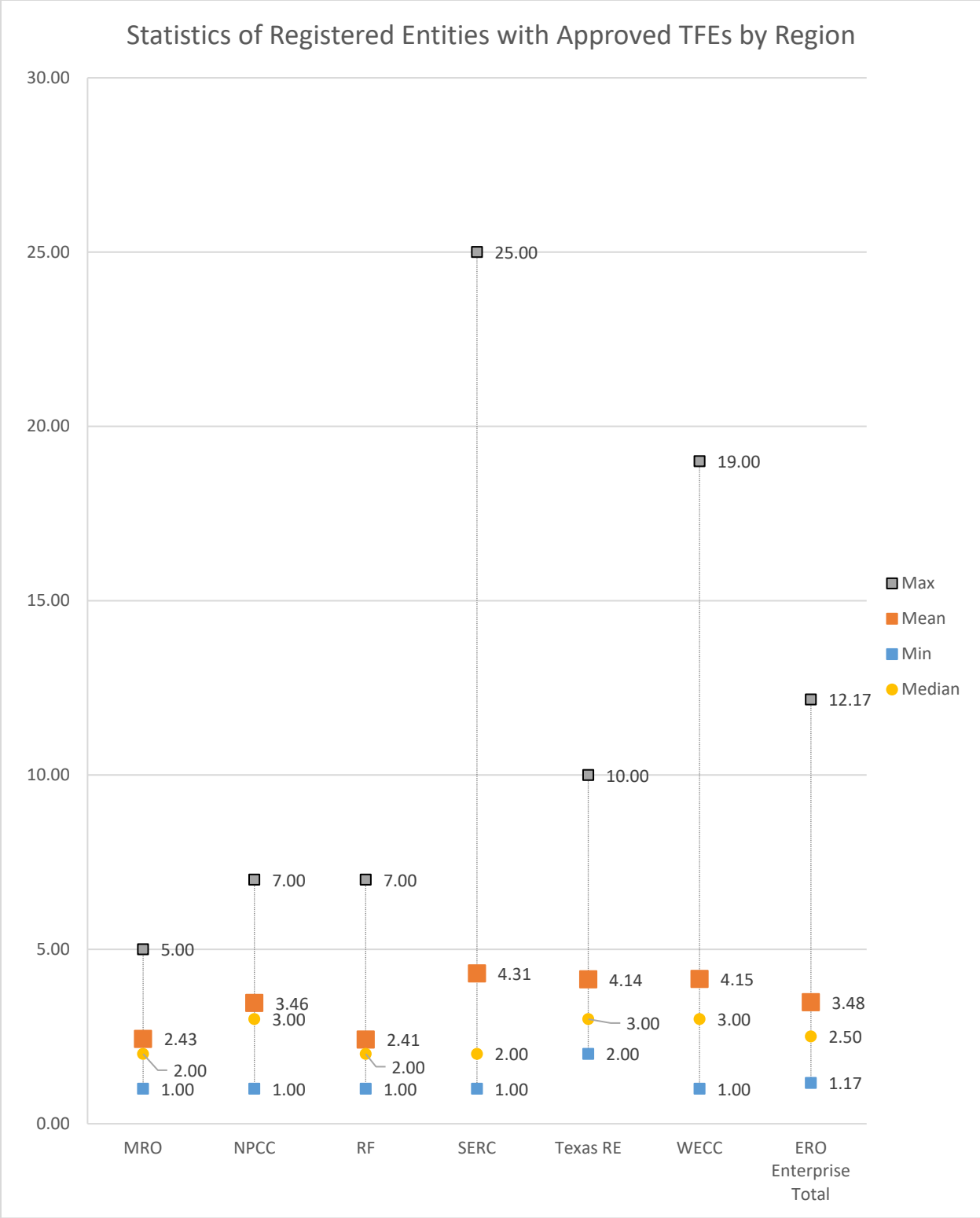


Figure 91: Statistics of Registered Entities with Approved TFEs by Region

2. Categorization of the submitted and approved TFE Requests

Categorization of the submitted and approved TFE Requests to date by broad categories such as the general nature of the TFE Request, the Applicable Requirements covered by submitted and approved TFE Requests, and the types of Covered Assets that are the subject of submitted and approved TFE Requests.

The total number of unique assets subject to TFEs has generally remained steady since 2019.²² In 2022, the total number of covered assets subject to TFEs continued to decrease to 10,859. In 2023, the total number of covered assets further decreased to 10,500. As noted, this number was underreported due to the way Align handles pending MCRs. When a request is in the pending status, then the assets in that TFE do not show up in the overall counts. There was a total of 40 requests that were pending on June 30, 2023, which resulted in over 3,000 assets not being included in the count (the original count prior to adjustment was 7,787). Several of these assets were included based on whether there was a previous version of the TFE already approved.

In 2024, the total number of covered assets is 11,051. This is an increase of about 41.92% over the unadjusted count from 2023 and 5.25% over the adjusted count. [Table 6](#) shows the difference between the unadjusted number of covered assets in 2023 and the unadjusted number of covered assets in 2024.

²² To better align with the CIP standards, the TFE Task Force in 2019 changed the categorization of the assets within TFEs from “Network Data Communications,” “Relays,” “Workstation/server,” and “Other” to “Electronic Access Control and Monitoring System (EACMS),” “Physical Access Control System (PACS),” “Protected Cyber Asset (PCA),” “BES Cyber Asset (BCA),” “BES Cyber System (BCS),” and “Other.” The “Other” category remained for those assets that do not fall into the other categories. For instance, telecommunication modems, protective relays, remote terminal units (“RTUs”), satellite clocks, etc.

	MRO	NPCC	RF	SERC	Texas RE	WECC	ERO Enterprise
EACMS	-2	-3	48	23	0	0	66
PACS	-7	0	1	87	-26	91	146
PCA	28	-49	8	1	43	259	290
BCA	4	-18	1176	-137	963	630	2618
BCS	140	0	0	0	-2	0	138
Other	8	0	-2	0	0	0	6

Table 6. Comparison between 2024 and 2023 Unadjusted Number of Covered Assets

Figure 12 shows the total number of assets within each asset category by Regional Entity for TFEs approved in 2024. This information shows the number of Covered Assets for all TFEs approved in 2024, including amendments and new TFEs. As with previous years, BCAs are the most common type of Covered Asset and Other are the least common type of Covered Asset. The number of EACMS covered by TFEs in SERC remains higher than all the other Regions due to a type of EACMS device that is widely used within the region. WECC still has the most unique assets covered by TFEs, which is a result of having the most entities with approved TFEs. While Texas RE has the fewest entities with approved TFEs, it has the second highest number of unique assets covered by TFEs. This is because Texas RE has five TFEs from three entities, which account for 84% of the Covered Assets in the Texas RE footprint.

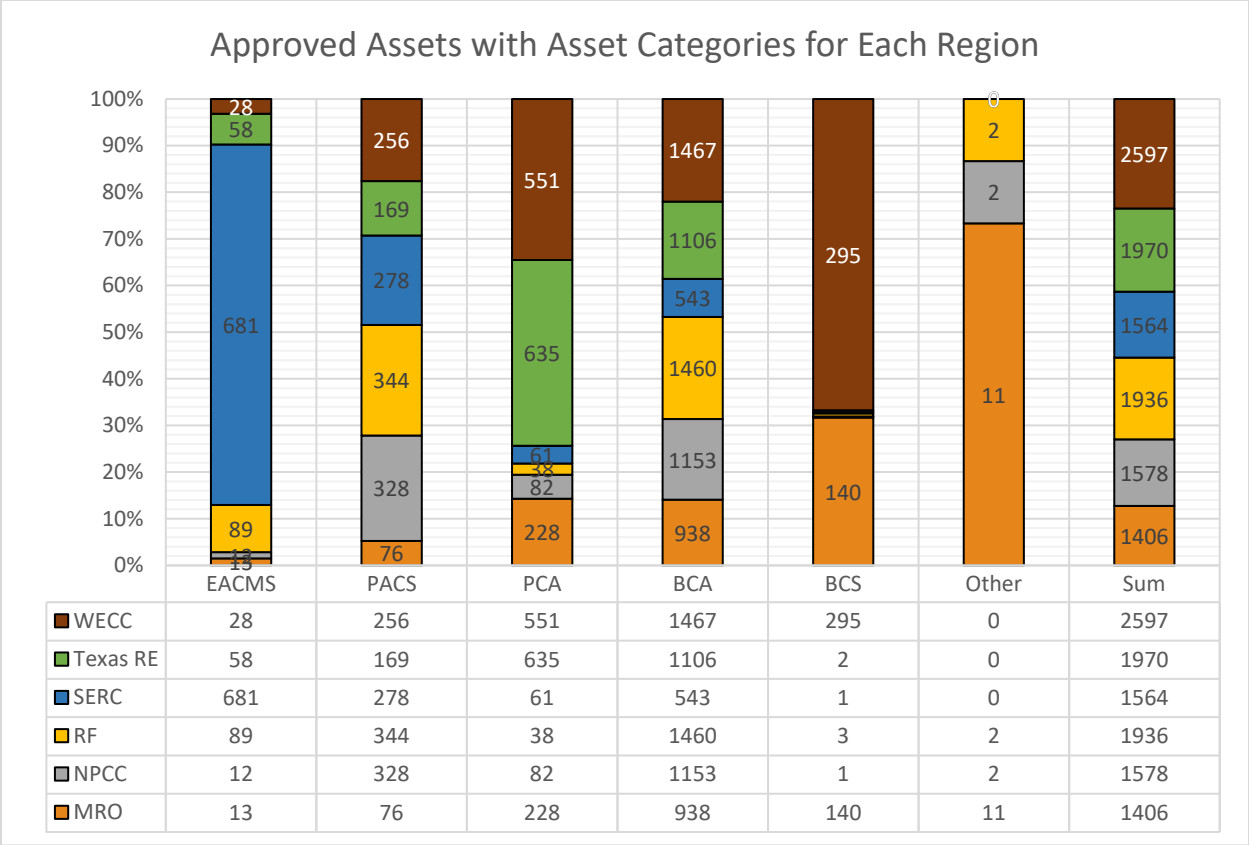


Figure 102: Numbers of 2024 Approved Assets with Asset Categories for Each Regional Entity

Figure 13 displays the total number of assets within each asset category for all currently active TFEs by region. The consistency across Regional Entities is that BCAs remain the largest asset category.

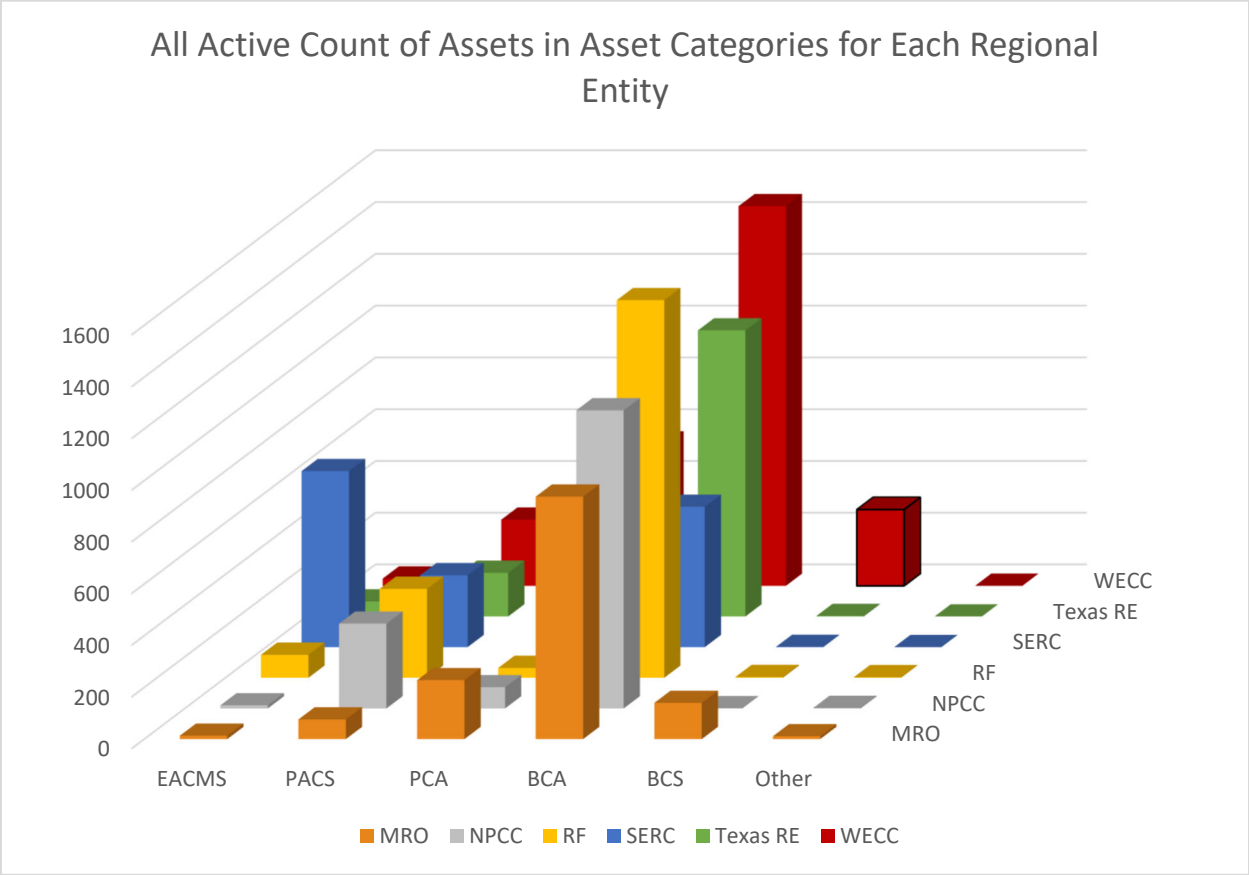


Figure 113: All Active Count of Assets in Asset Categories for Each Regional Entity

Figure 14 below shows the percentage of assets within each asset category and region compared to the total number of assets covered by TFEs in the entire ERO Enterprise for the 2024 reporting period. Figure 14 is consistent with Figure 12 and Figure 13 with the BCA category accounting for the largest percentage in each region. Due to the amendment of TFEs for EACMS in the SERC region from 2023, the percentages of EACMS and BCA remains almost identical.

Percentage of Assets by Asset Category across ERO Enterprise

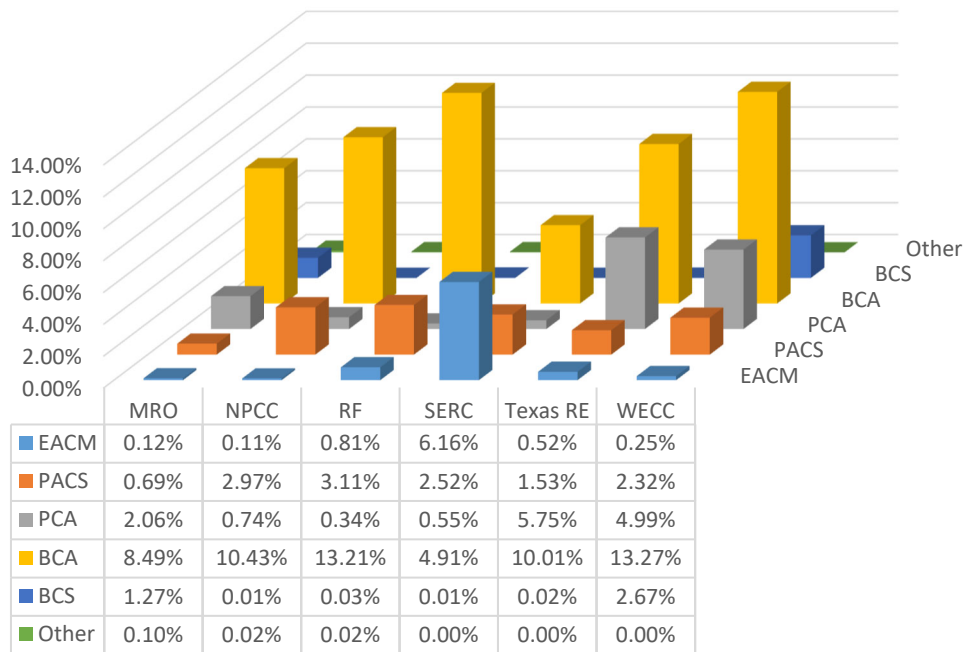


Figure 124: Percentage of Assets in each Asset Category by Percentage across the ERO Enterprise

Figure 15 shows the total asset allocation broken out by Regional Entity by displaying the proportion of assets covered by TFEs in each region attributed to each category. Consistent with Figure 12, Figure 13, and Figure 14, the BCA category accounts for the largest percentage in each region except for SERC. Due to the termination of a TFE, EACMS is now the most prevalent Covered Asset in this region.

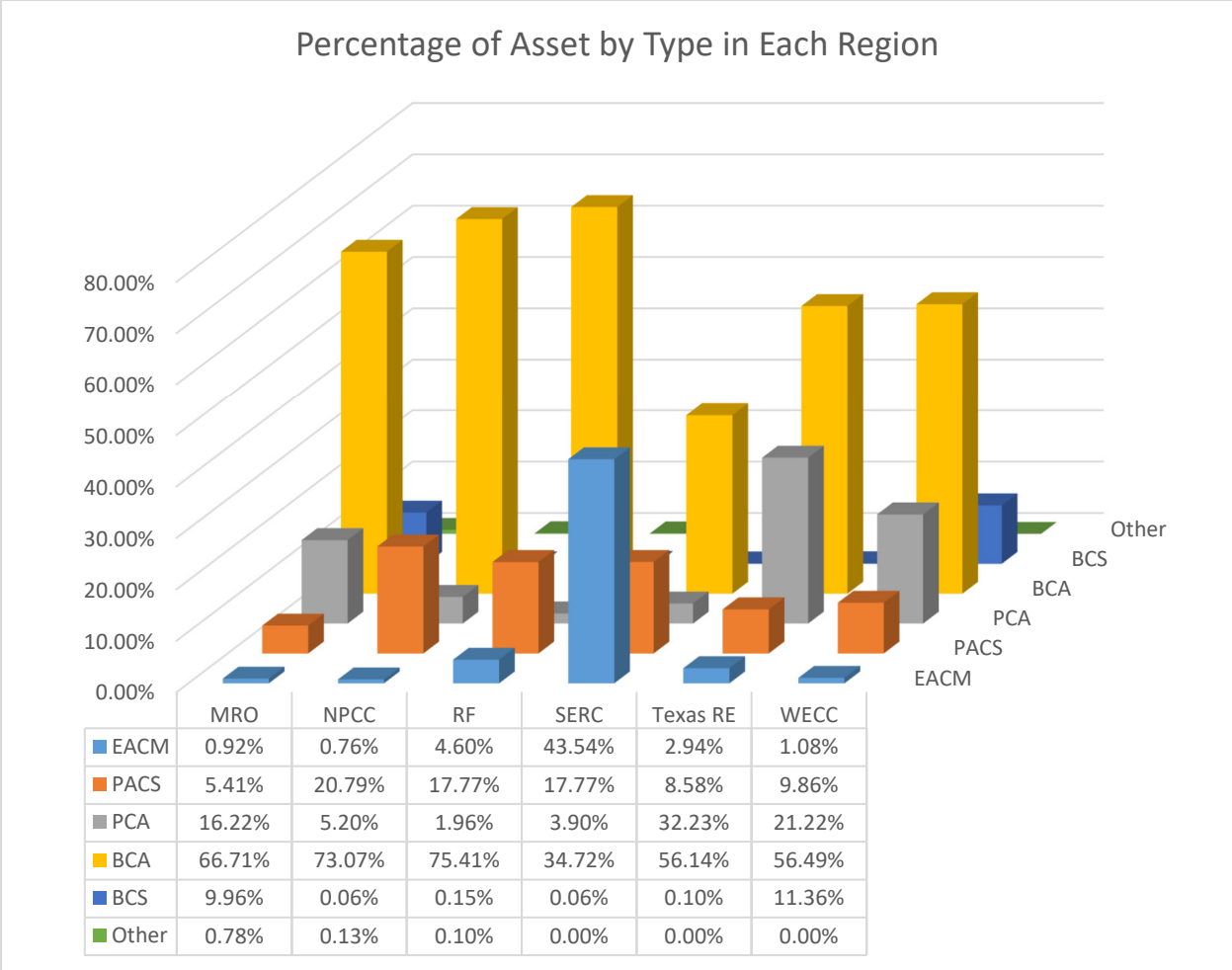


Figure 1513: Percentage of Assets by Type in each Region

3. Categorization of the circumstances or justification

Categorization of the circumstances or justifications on which the approved TFEs to date were submitted and approved, by broad categories such as the need to avoid replacing existing equipment with significant remaining useful lives, unavailability of suitable equipment to achieve Strict Compliance in a timely manner, or conflicts with other statutes and regulations applicable to the registered entity.

The following are criteria that a registered entity may use to request a TFE:

- Not technically possible;
- Operationally infeasible;

- Precluded by technical limitations;
- Adverse effect on bulk electric system reliability;
- Cannot achieve by compliance date;
- Excessive cost that exceeds reliability benefit;
- Conflicts with other statutory or regulatory requirement; and
- Unacceptable safety risks.

Align provides a breakdown of the types of justification for the 329 approved TFEs in the ERO Enterprise. [Figure 16](#) shows the breakdown by region for each type of justification. The majority of TFEs are approved for justifications of “not technically possible” (294) and “operationally infeasible” (29). There are only three TFEs approved for “excessive cost that exceeds reliability benefit,” two for “unacceptable safety risks,” and one for “conflicts with other statutory or regulatory requirement.” There are no TFEs approved for the justifications of “precluded by technical limitations,” “adverse effect on BES reliability,” or “cannot achieve by compliance date.”

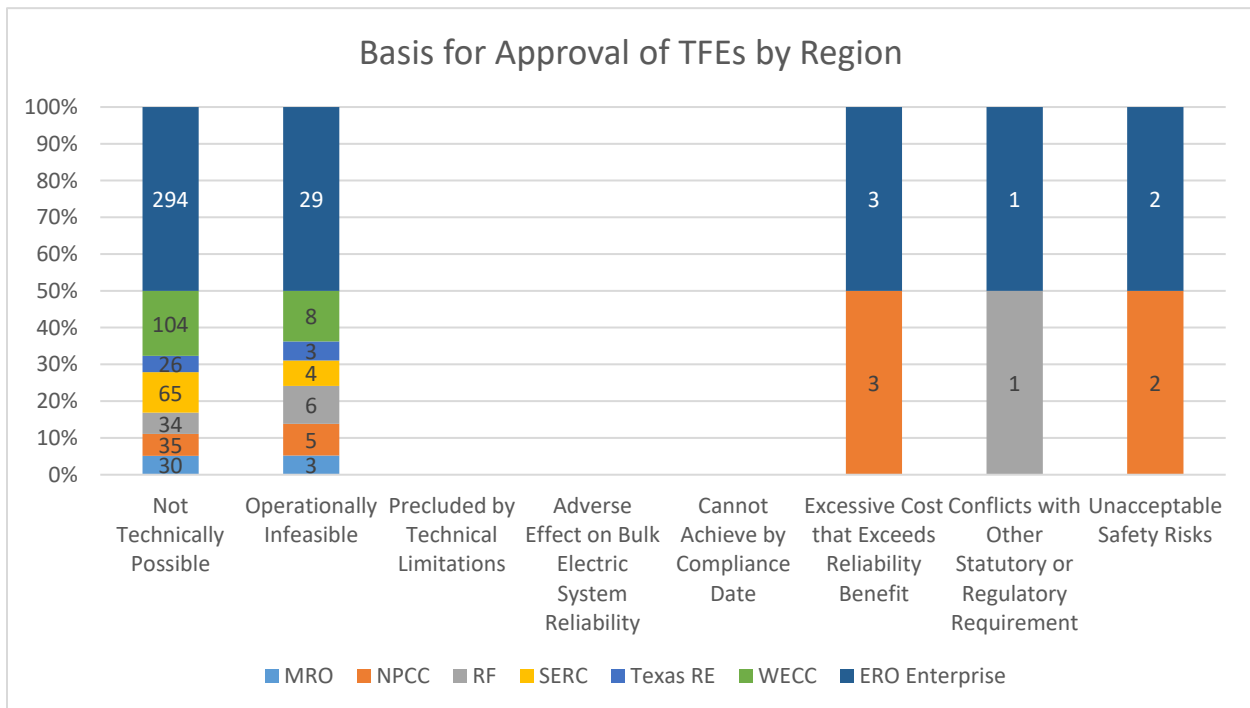


Figure 1614: Justification for Approved TFEs by Region and Type

4. Categorization of the compensating measures and mitigating measures implemented and maintained

Categorization of the compensating measures and mitigating measures implemented and maintained by registered entities pursuant to approved TFEs, by broad categories of compensating measures and mitigating measures and by types of Covered Assets.

The ERO Enterprise continues to evaluate the extent and effectiveness of compensating measures documented in TFE requests. The registered entities accomplish the majority of compensating or mitigating measures by compliance with requirements in related CIP Standards. As most TFEs relate to the same types of assets, the registered entities are applying similar mitigation measures for each of the TFEs to address the known risks. These mitigating measures typically rely on principles of defense-in-depth using additional physical security measures, logical access via Intermediate Systems, network isolation, enhanced firewall rules, increased monitoring and alarming of access logs and other techniques. Align allows ERO Enterprise staff to view justifications and the compensating measures used to address each TFE. This is an improvement on the previous method of collecting this data as it is in one location that NERC can view rather than only requesting the information from the Regional Entities. As of the 2024 Reporting Period, ERO Enterprise staff have increased use of the ERO Enterprise Secure Evidence Locker (“SEL”) to request evidence related to verifying mitigating measures. Often the description captured in Align provides less detail of actual controls than the evidence of these controls reviewed in the SEL.

5. TFE rejection or disapproval

For each TFE Request that was rejected or disapproved, and for each TFE that was terminated, but for which, due to exceptional circumstances as determined by the Regional Entity, the TFE Termination Date was later than the latest date specified in Section 5.2.6, or 9.3, as applicable, a statement of

the number of days the registered entity was not subject to imposition of findings of violations of the Applicable Requirement or imposition of Penalties or sanctions pursuant to Section 5.3.

In 2024, there were a total of seven TFEs that were disapproved. Of these, four were in WECC, two in SERC and one in RF. The disapproved TFEs consisted of two new TFEs and five amended TFEs. Of the new TFE disapprovals, one was for CIP-007-6 Requirement R5, Part 5.6 and the other was for CIP-007-6 Requirement R5, Part 5.7. Among the five amended TFE disapprovals were two for CIP-007-6 Requirement R5, Part 5.6; one for CIP-007-6 Requirement 4, Part 4.3; one for CIP-007-6 Requirement R5, Part 5.1 and one for CIP-010-4 Requirement R3, Part 3.2. The reasons behind the disapprovals varied; the most common reason was inaccurate asset counts (one in RF and two in WECC), followed by the entity determining that the assets did not require a TFE (two in WECC), a TFE submitted to the wrong Lead Regional Entity (SERC), and finally an accidental disapproval (SERC) in which the entity was required to submit another MCR.

6. Compliance Audit results and findings concerning the implementation and maintenance of compensating measures and mitigating measures

A discussion, on an aggregated basis, of Compliance Audit results and findings concerning the implementation and maintenance of compensating measures and mitigating measures, and the implementation of steps and the conduct of research and analyses to achieve Strict Compliance with the Applicable Requirements, by registered entities in accordance with approved TFEs.

Appendix 4D of NERC's ROP is part of the Compliance Monitoring and Enforcement Program ("CMEP") that forms the framework for Regional Entities to review and audit TFE requests. During a compliance monitoring engagement, the Regional Entity would not evaluate the registered entity on a particular requirement from the applicable Reliability Standard for which a TFE was accepted and approved. Instead, the Regional Entity would evaluate the registered entity

against the alternative compliance obligations assumed by the registered entity (i.e., compensating and mitigating measures).

All Regional Entities continue to conduct compliance monitoring engagements where applicable approved TFEs are within the determined scope. Typically, during a compliance monitoring engagement of a registered entity, TFEs will be reviewed as applicable (i.e., based on relevant factors such as quantity, locations, etc.). Reviews include, among other things, interviewing subject matter experts specifically about TFEs and sampling evidence pertaining to a TFE's mitigating and compensating measures. Regional Entities continue to report that registered entities are managing and maintaining their TFEs within the procedural requirements of Appendix 4D. Regional Entities and registered entities continue to handle TFEs consistent with the CMEP framework.

7. Assessments of impacts on the reliability of the BES

Assessments, by Regional Entity (and for more discrete areas within a Regional Entity, if appropriate) and in the aggregate for the United States and for the jurisdictions of other Applicable Governmental Authorities, of the Wide-Area impacts on the reliability of the Bulk Electric System of approved TFEs in the aggregate, including the compensating measures and mitigating measures that have been implemented.

The ERO Enterprise TFE Task Force, comprised of subject matter experts from each Regional Entity and NERC, reviews TFE requests to verify sufficiency and consistency of the requests' disposition. In addition, the ERO Enterprise TFE Task Force verifies the TFEs are available for review; the ERO Enterprise performs the review when initially submitted or modified and during compliance monitoring engagements. The ERO Enterprise TFE Task Force reports that the use of TFEs has not had an adverse impact on BPS reliability. The members of the ERO Enterprise TFE Task Force reported similar experiences (among different Regions) with the execution and management of the TFE process and the way it impacted BPS reliability.

Additionally, the TFE Task Force reports that a large majority of registered entities have implemented multiple compensating and mitigating measures for Covered Assets. In general, the mitigating and compensating measures implemented for approved TFEs in lieu of strict compliance with applicable CIP Reliability Standards have accomplished the stated alternate compliance objectives. As a result, the level of BES security achieved through the TFE process is comparable to strict compliance with the applicable Reliability Standards.

Figure 17 shows, by region, the number of TFEs for each requirement that registered entities submitted to the Regional Entities in 2024. The largest number of approved TFEs in 2024 were for CIP-007-6 Requirement R5 Part 5.7. In contrast, CIP-007-6 Requirement R1, Part 1.1 only has one TFE and CIP-010-4 Requirement R3, Part 3.2 has two TFEs.

2024 Approved TFEs Breakout by Requirement and Part

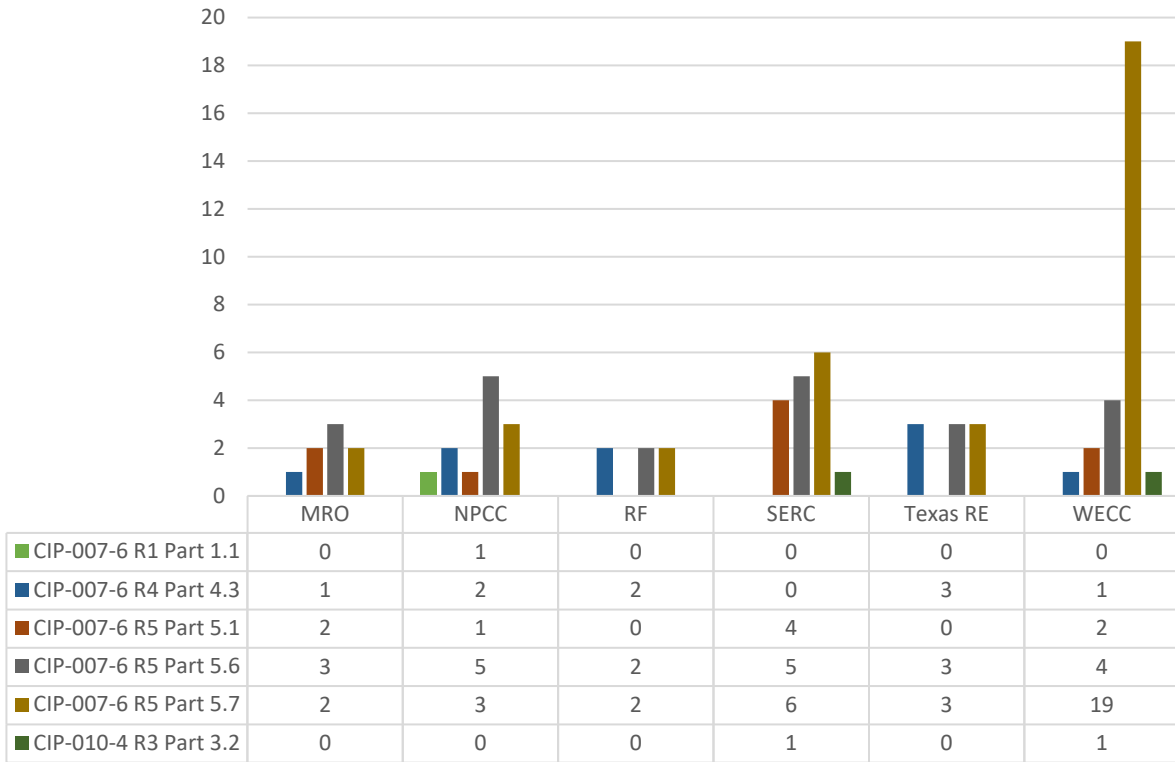


Figure 157: 2024 Approved TFE Breakout per Requirement and Part

Figure 18 demonstrates the same breakdown by Reliability Standard and requirement as Figure 17, but includes all active TFEs, not just those from 2024. Again, the majority of the approved TFEs are for CIP-007-6 Requirement R5, Parts 5.6 and 5.7. In contrast, CIP-005-7 Requirement R1, Part 1.4; CIP-005-7 Requirement R2, Parts 2.1 and 2.2; and CIP-010-3 Requirement R1 Part 1.5 only have one TFE each.

All Active TFEs Breakout by Requirement and Part

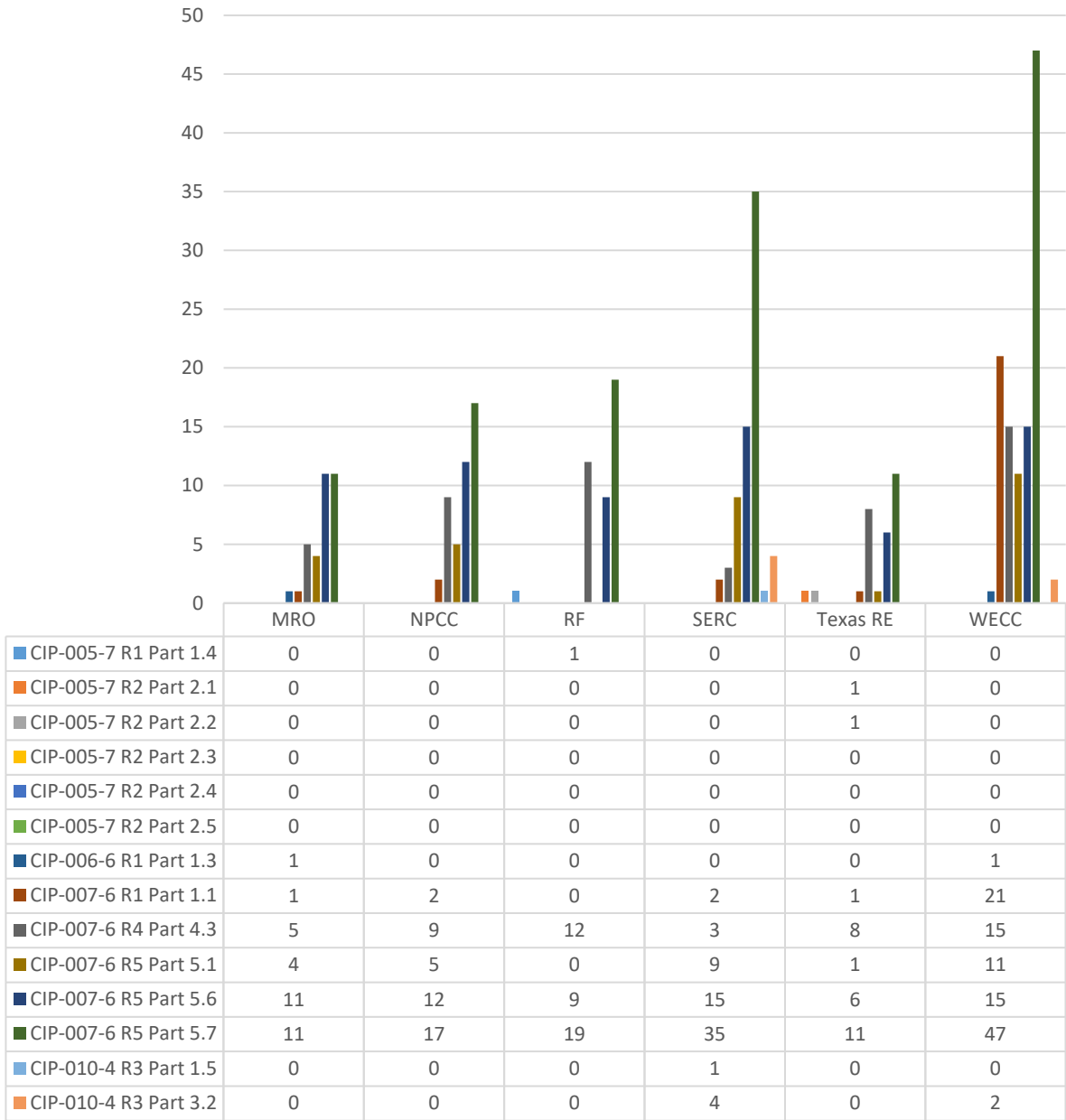


Figure 18: All Active TFE Breakout per Requirement and Part

8. Efforts to eliminate future reliance on TFEs

Discussion of efforts to eliminate future reliance on TFEs.

In the past, the value of a TFE was the safe harbor it provides when a registered entity could not achieve strict compliance to certain Reliability Standards. As referenced in Order No. 706, TFEs are rooted in the challenge of legacy equipment and the economic considerations involved in the replacement of such equipment before the end of its useful life.²³ The value of the TFE program, as currently constructed, is diminishing in comparison to the program's administrative burden as registered entities increasingly retire legacy equipment. The decrease in the number of approved TFEs and the total assets covered by TFEs since the inception of the TFE Program has consequently reduced the level of effort required of the registered entity and Regional Entity to maintain and administer a TFE. Additionally, the migration of TFE data from the Regional Entities to the Align tool made the analysis of this data less burdensome. ERO Enterprise CMEP processes regularly assess general compliance with the CIP Reliability Standards and evaluate compensating and mitigating measures.

During quarterly meetings, the ERO Enterprise TFE Task Force focuses on TFE management, administrative processes, and approaches to making the processes more effective and efficient for the Regional Entities and registered entities. Due to the Reliability Standards changes proposed by Project 2016-02, the ERO Enterprise will see a significant reduction in the administrative burden surrounding TFEs. For example, as registered entities phase out TFEs during the implementation of the proposed revised CIP Reliability Standards, there will be fewer TFEs for the ERO Enterprise to manage, and there will be no TFEs after the effective date of the proposed revised CIP Reliability Standards. As NERC considers alternatives to the TFE program

²³ Order No. 706 at P 157.

as presently constituted, it will consult with Commission staff. NERC will seek Commission approval for any proposed changes to the NERC ROP.

9. Material Change Reports

Data and information regarding Material Change Reports, including the number of Material Change Reports filed annually and information regarding the types of circumstances or events that led to Material Changes, as well as any additional information NERC believes would be useful.

When registered entities modify the information associated with approved TFEs, the registered entity submits updates to the relevant Regional Entity via an MCR. An MCR requires approval by the Regional Entity, which can then refer to the updated, current data during compliance monitoring activities (e.g., Compliance Audits, Spot Checks, Self-Certifications). Figure 19 shows the percentage of amendments per approved TFEs within each region. Most requested changes occur for asset count changes and administrative updates, such as changing the primary contact's information. The average across the ERO Enterprise for 2024 is 16.72% when calculated as an average across the percentage of each region. This means that for a little under one-fifth of the TFEs, a registered entity submitted a MCR to modify an approved TFE. This is a moderate decrease from 2023, when 28.25% of TFEs had a registered entity submit an MCR to modify an approved TFE. In general, this is expected as there has been less activity in the TFE program overall. When comparing requests for amendments from 2023 to 2024, there was a decrease from 98 requests to 55 requests for amendments.

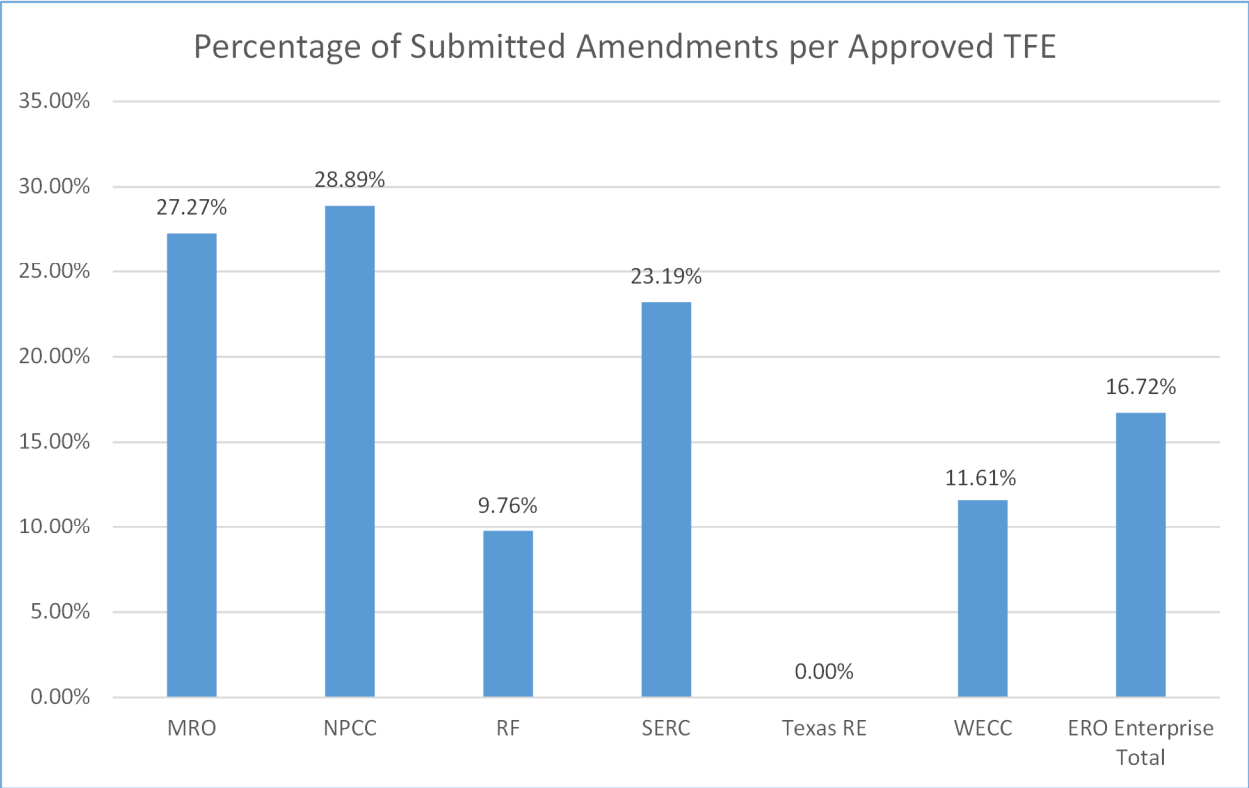


Figure 19: TFE Amendments to Approved TFEs per Regional Entity

10. Additional information about TFEs and their TFE Expiration Dates

Additional information about TFEs and their TFE Expiration Dates, including the number of TFEs by expiration year and CIP Standard requirement, the percentage of currently approved TFEs without TFE Expiration Dates, and the number of new TFEs approved without expiration dates annually.

In its September 2013 Order, the Commission directed NERC to provide additional information in the annual TFE reports related to TFEs with and without expiration dates. As reported previously, most TFEs do not have expiration dates. During the 2024 reporting period, 44 TFEs were terminated, all of which were for requirements in CIP-007-6. Of these 44 TFEs, 27 were for CIP-007-6 Requirement R5, Part 5.7; eight were for CIP-007-6 Requirement R4, Part 4.3; six were for CIP-007-6 Requirement R5, Part 5.6; two were for CIP-007-6 Requirement R5, Part

5.1; and one was for CIP-007-6 Requirement R1, Part 1.1. Most of these terminations were due to lifecycle replacements of equipment which are now capable of meeting these requirements.

In addition, four TFEs are scheduled to expire in the future, unless further amended by the registered entity. Figure 20 shows the breakdown of TFEs with future expiration dates. The vast majority of approved TFEs have no planned expiration date. In addition, there are no currently scheduled expirations identified after June 30, 2025.

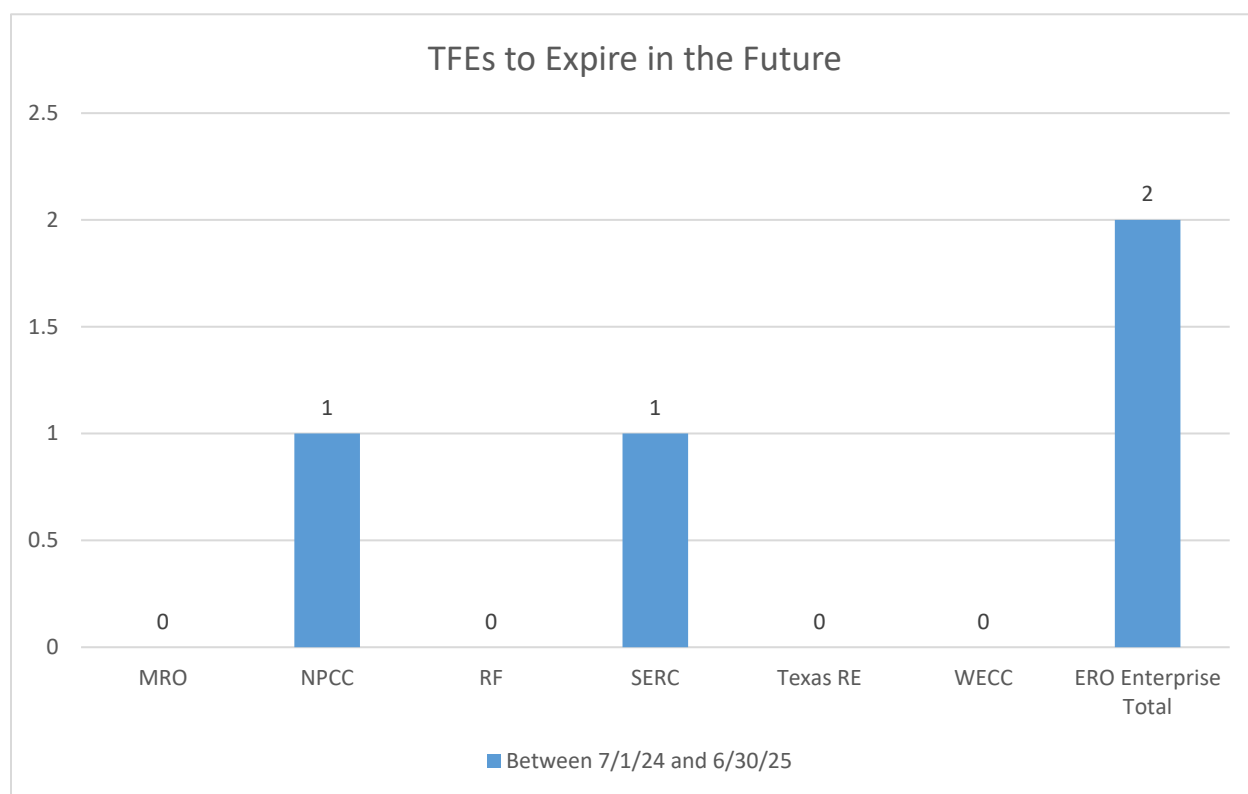


Figure 20: TFEs to Expire in Future

11. Consistency in Review, Approval, and Disapproval of TFE Requests

Appendix 4D, Section 11.1 of the NERC ROP requires that NERC and the Regional Entities collaborate to assure “consistency in the review, approval and disapproval of TFE Requests....” Also, as noted above, Section 11.2.4 of Appendix 4D requires that NERC submit

with each Annual TFE Report certain information concerning the manner in which Regional Entities have made determinations to approve or disapprove TFE requests. The scope document for the ERO Enterprise TFE Task Force describes activities and deliverables that support this effort:

- Review Regional Entities' processes and performance in administering TFE Requests and Material Change Reports;
- Evaluate whether the administration of TFE activities among the Regional Entities yields consistent results;
- Assess compensating and mitigating measures described in TFEs for quality and sufficiency;
- Review approved and disapproved TFE Requests or Material Change Reports for consistency; and
- Monitor approved TFEs throughout their life cycle to determine whether they remain necessary and effective.

The ERO Enterprise TFE Task Force will continue to collaborate on these actions in 2024 and 2025. Additionally, the ERO Enterprise TFE Task Force continue to review the TFE data throughout the year to inform the analysis provided in the annual reports submitted to the Commission.

V. CONCLUSION

For the foregoing reasons, NERC respectfully requests that the Commission accept the 2024 Annual Report.

Respectfully submitted,

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