The Joint Commenters on NOGRR 245

Presentation at the TAC Workshop for NOGRR 245

May 10, 2024

Identification of the Joint Commenters

Our IBRs in ERCOT

~15 GW in operation

~5 GW under development/in construction

This presentation is jointly authored and represents the collaboration and compromise of a diverse set of Market Participants registered with ERCOT. Statements made herein should not be used to represent the position of an individual company in any proceeding unrelated to NOGRR245.

Our goals for today's workshop

- Recap how the NOGRR245 TAC Report improves ride-through capability and grid reliability
- Respond to concerns and questions
- Ensure that any remaining concerns about outstanding reliability risk are backed by data and evidence

Basis for Supporting TAC Report

It substantially improves IBR performance requirements for the ERCOT system, setting the strongest reliability standard in the country.

It <u>requires existing IBRs to implement software and firmware upgrades.</u> This means the reliability issues behind the Odessa events will be solved. Reasonable hardware upgrades are also required. For the IBRs that request limited exemptions, ERCOT can deny the exemption if it disagrees with the assessment of commercial reasonability.

It sufficiently addresses reliability risk. No analysis exists that shows that the TAC Report fails to address known reliability risks. It requires reporting that will provide ERCOT with a vastly improved understanding of capabilities and limitations that can serve as the basis for future NOGRRs as needed.

The NOGRR 245 TAC Report increases reliability without forcing Existing IBRs to make unreasonable physical modifications

TAC Report Includes:	NOGRR Cite:
• **For New IBRs with SGIAs after 6/1/24 (and Existing IBRs with future modifications), imposes essentially the same stringent ride-through requirements as ERCOT** • Aligned with or exceeds IEEE 2800-2022, even while the testing and verification standard is under development.	**Sections 2.6.2.1 , 2.9.1, 2.9.1.1**
• **For Existing IBRs, imposes a single set of performance standards, even on IBRs that are currently exempt**	**Sections 2.6.2.1.1, 2.9.1, 2.9.1.2**
• Requires software modifications; also requires commercially reasonable physical modifications	2.11
• Creates an ongoing duty to identify, evaluate, and deploy such modifications as they become available, with annual reporting to ERCOT	2.12, 2.14
• Allows for specific exemptions/extensions when all required modifications are deployed but the new performance standard cannot be fully met or more time is required for OEM development	2.13

The NOGRR245 TAC Report provides an appropriate process to review exemption requests

TAC Report Includes:	NOGRR Cite:
A definitive extension/exemption review timeline:	**Section 2.13.1.3**
10 Bus. Days of Entity Request — ERCOT acknowledges receipt and requests missing information → **10 Bus. Days of ERCOT Request** — Entity supplies any missing information → **Within 180 Days of Entity Request** — ERCOT approves, approves in part, or rejects the request	
An expedited ERCOT reconsideration and PUC review process:	**Sections 2.13.1.4, 2.13.1.4.1**
10 Bus. Days After Rejection — Entity appeals ERCOT rejection and provides any supplemental information → **Within 30 Days of Appeal** — Entity and ERCOT meet regarding appeal → **Within 30 Days or 10 Days from Mtg.** — ERCOT issues a final decision, which the entity can appeal to the PUC	

Existing IBRs must make software modifications to maximize ride through. They must also make commercially reasonable physical modifications.

Questions	Answers

What modifications must existing IBRs make?	• **Modifications involving only software, firmware, settings or parameterization changes are required.** There is no commercial reasonability analysis of these modifications. The TAC Report reflects consideration of the time and cost to develop, test, model, and deploy. Only software modifications that ERCOT agrees are unreasonably priced are not required.
	• **Physical modifications that are commercially reasonable are also required.**
	  • With what we know today, minor retrofit kits would likely be commercially reasonable in most cases.
	  • More extensive modifications would likely not be in most cases but may be in some.

Why is commercial reasonability necessary for existing IBRs?	• **New modifications impose new costs on existing IBRs that previously passed ERCOT's interconnection process**. Commercial reasonability is necessary to expand requirements to some physical modifications of existing IBRs that may not otherwise be required. • In contrast, new IBRs are required to meet the requirements without any commercial-reasonability qualifier.
Why not simply require modifications under a certain cost cap instead?	• **Incremental ride through improvements and cost benefit analysis will vary on a case-by-case basis**, so any analysis must consider a range of relevant inputs rather than a single, arbitrary cost cap for all. • **Proposed price caps are arbitrarily high, exposing IBRs to excessive cost without an objective metric for the value of the ride through improvement**. See the illustrative examples in the appendix.
How is reliability considered in the commercial reasonability analysis?	• **Reliability is an explicit factor in the commercial reasonability analysis**: "(vi) whether the improvement would materially enhance its ride through capabilities." NOGRR Section 2.11(2)(vi). • **Because ride-through capability improvement is a factor in the analysis, ERCOT would also consider it in its review of any exemption request.**

ERCOT Staff will know what modifications exist for Existing IBRs and can reject exemption requests when a software modification or commercially reasonable physical modification is available.

Questions	Answers

How will ERCOT know what modifications are available?	• **From the IBRs and the OEMs:**
	  • IBRs have an ongoing duty to identify, evaluate, and deploy commercially reasonable modifications.
	  • IBRs must report on modifications considered but not deployed. NOGRR 245 Sections 2.12.1(1)(c), 2.12.2(1)(c).
	  • ERCOT will continue to talk to the OEMs directly. Three wind-turbine OEMs (GE, Vestas, and Siemens Gamesa) and two inverter OEMs (TMEIC and Power Electronics) account for most of the existing operating wind and solar capacity in ERCOT.

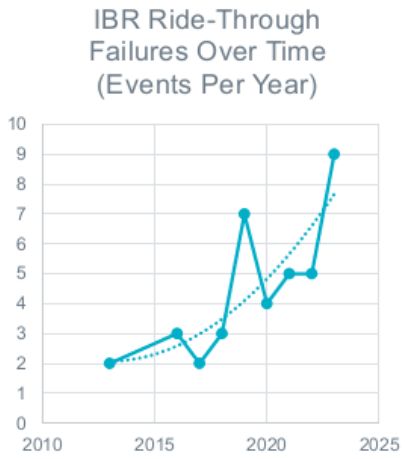
How will ERCOT know what is commercially reasonable?	• **IBRs must substantiate any claim** that a technically feasible physical modification is not commercially reasonable. • **ERCOT will receive annual reports from all IBR Resources** to see who is implementing available modifications and who is not.
What if ERCOT disagrees with the IBR about what is commercially reasonable?	• **ERCOT may reject the exemption request** if "the Requesting Resource entity fails to demonstrate, to ERCOT's reasonable satisfaction: . . . the Resource Entity has . . . (i) Maximized the ride-through capability of the [Resource] with all available commercially reasonable modifications." NOGRR 245 Section 2.13.1(2)(a)(ii). • **The PUCT is the final arbiter if the IBR appeals ERCOT's rejection.**

ERCOT's IBR ride-through summary provides a useful starting point for understanding the scope of the issue and progress on mitigations to date

ERCOT's data include:

- Events in ERCOT (32) and WECC (10) from Nov. 2013 through Mar. 2024
- Events from 21 MW up to events large enough to trigger a NERC event analysis (> 500 MW).
- Events involving solar and wind IBRs

- 444 MWs - 11/22/13 (ERCOT)
- 550 MWs - 11/26/13 (ERCOT)
- 415 MWs - 3/22/16 (ERCOT)
- 356 MWs - 4/9/16 (ERCOT)
- 1178 MWs - 8/16/16 (WECC Blue Cut)
- 551 MWs - 1/10/17 (ERCOT)
- 1619 MWs - 10/9/17 (WECC Canyon 2)
- 2102 MWs - 4/20/18 (WECC Angeles Forest)
- 1656 MWs - 5/11/18 (WECC Palmdale Roost)
- 222 MWs - 12/26/18 (ERCOT)
- 382 MWs - 1/22/19 (ERCOT)
- 241 MWs - 1/22/19 (ERCOT)
- 269 MWs - 4/18/19 (ERCOT)
- 497 MWs - 5/20/19 (ERCOT)
- 21 MWs - 10/6/19 (ERCOT)
- 298 MWs - 10/25/19 (ERCOT)
- 201 MWs - 12/17/19 (ERCOT)
- 562 MWs - 3/18/20 (ERCOT)
- 112 MWs - 5/7/20 (ERCOT)
- 1290 MWs - 7/7/20 (WECC San Fernando)
- 157 MWs - 11/16/20 (ERCOT)
- 1148 MWs - 5/9/21 (ERCOT)
- 910 MWs - 6/24/21 (WECC Victorville)
- 518 MWs - 6/26/21 (ERCOT)
- 776 MWs - 7/4/21 (WECC Tumbleweed)
- 557 MWs - 7/28/21 (WECC Windhub)
- 886 MWs - 8/25/21 (WECC Lytle Creek)
- 492 MWs - 3/22/22 (ERCOT)
- 457 MWs - 3/22/22 (ERCOT)
- 1711 MWs - 6/4/22 (ERCOT)
- 542 MWs - 10/21/22 (ERCOT)
- 179 MWs - 10/27/22 (ERCOT)
- 106 MWs - 1/16/23 (ERCOT)
- 253 MWs - 1/23/23 (ERCOT)
- 372 MWs - 1/24/23 (ERCOT)
- 271 MWs - 3/10/23 (ERCOT)
- 396 MWs - 3/24/23 (ERCOT)
- 921 MWs - 4/10/23 (WECC SW Utah)
- 246 MWs - 10/6/23 (ERCOT)
- 108 MWs - 11/7/23 (ERCOT)
- 31 MWs - 12/10/23 (ERCOT)
- 219 MWs - 3/5/24 (ERCOT)



Of the ERCOT events listed, 4 resulted in NERC reports:

Solar: Odessa 1 (1,148 MW), Odessa 2 (1,711 MW)

Wind: Panhandle (492 MW, 457 MW), Other (542 MW).

According to NERC:

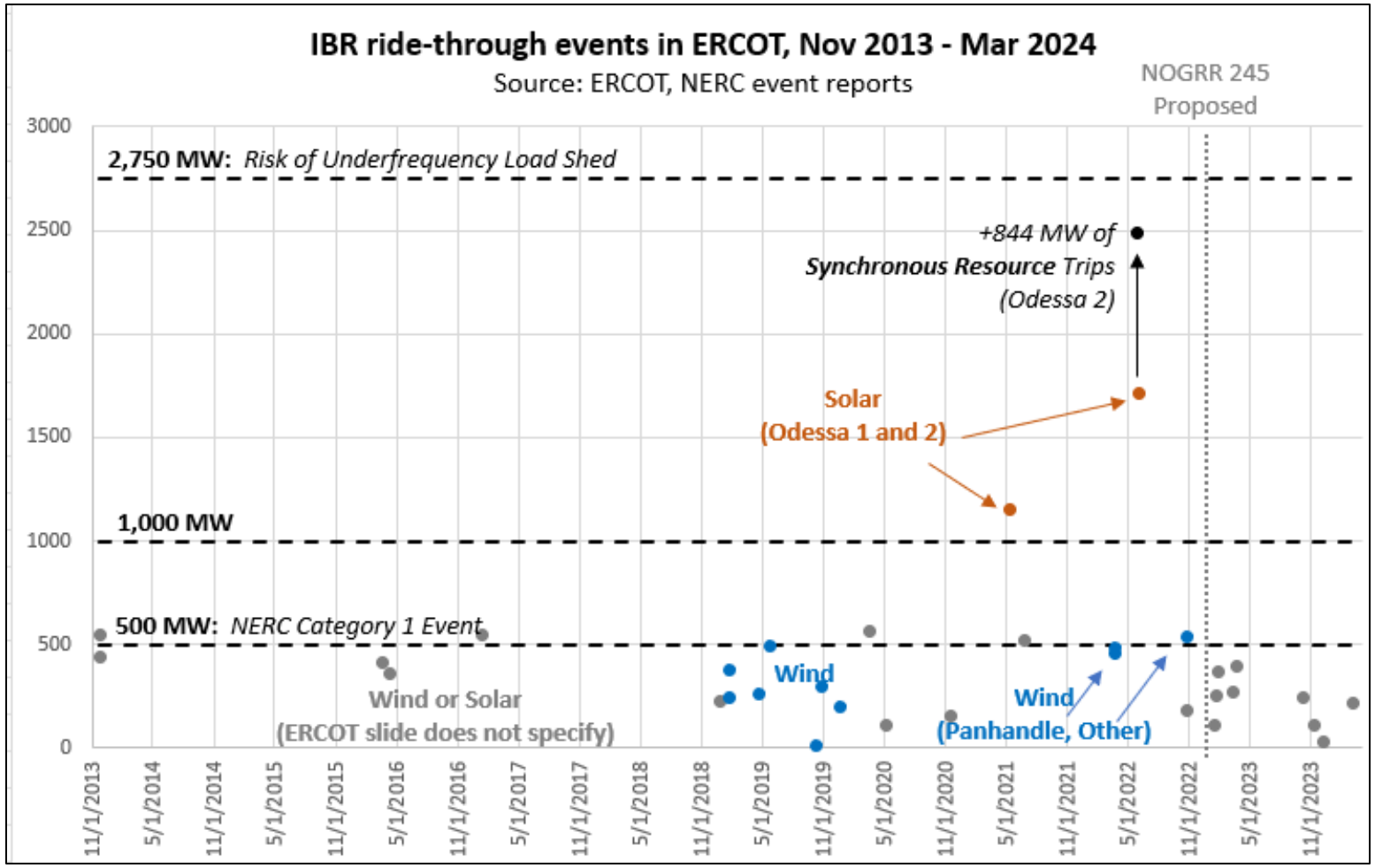
> "Numerous disturbance reports published by the ERO Enterprise provide strong evidence of systemic deficiencies in the performance of inverter-based resources (IBR) during grid events…**However, the performance deficiencies appear to be of greatest risk in BPS-connected solar PV resources**."

NERC_Inverter-Based_Resource_Performance_Issues_Public_Report_2023

Sources and notes:

- ERCOT Staff's presentation to the ERCOT Board's Reliability and Markets Committee on 4/22, slide 4.
- ERCOT events with NERC reports are outlined above.
- It is unclear whether the count of events is increasing relative to installed IBR capacity. More recent events are more likely to have been identified due to increases in attention and improvements in tracking.

The Odessa events stand apart from others in ERCOT



Both ERCOT events >1,000 MW were primarily solar.

There were ~37 GW-years of solar operation over the last 10+ years vs. ~217 GW-years of wind operation over the same period.

Sources and notes:

- Data points were taken from ERCOT's presentation to the Reliability and Markets Committee of the ERCOT Board of Directors on 4/22, slide 4. ERCOT points were included, not WECC.
- Of the reductions listed by ERCOT, 4 resulted in NERC event reports: Odessa 1, Odessa 2, Panhandle, and November 2023 ("Other") report of prior wind event. These events are marked by name.
- ERCOT's slide 4 did not specify technology. Technology was added based on NERC report information (4 data points) and cross-referencing with a previous ERCOT presentations from August 2023 to the IBR WG (7 data points).
- 2,750 MW is the Resource Loss Protection Criteria from NERC BAL-003.

Modifications to avoid the Odessa issues are already being deployed throughout ERCOT

Equipment Manufacturer	IBRs in ERCOT[65]	IBRs in 2022 Odessa Event	Deployed Solutions[66]
TMEIC	32% (36 facilities)	65% (8 facilities)	• 4 systemic issues; all now have software, settings, or firmware solutions • Solutions largely deployed at the 8 Odessa projects. (6 of 8 have all 4 changes made; remaining 2 have 3 out of 4 changes made to-date and plan to deploy remaining changes) • For the 28 projects not involved in Odessa events, solutions are either deployed (11), planned for 2024 (9), or plan is under development (7), except for 1 generator in construction
Power Electronics	22% (23 facilities)	29% (5 facilities)	• 1 systemic issue – has a firmware solution • Some non-systemic, project-specific issues and limitations at the 5 affected facilities • 5 facilities involved in Odessa events appear to be working with ERCOT to maximize capability and document remaining limitations • Outside Odessa, 16 of 18 projects have fixed the systemic issue through a firmware upgrade; ERCOT is following up with remaining 2 facilities
KACO	7% (8 facilities)	6% (4 facilities)	• At the 4 Odessa projects, limited corrective actions identified; 3 of 4 implemented • No data provided on the remaining 4 projects (not involved in previous disturbances) • KACO no longer in service

Sources and notes:
- Table from Exhibit A of the Joint Commenter's April 15, 2024 comments in NOGRR 245.
- Raw data:
  - Solar PV % shares are from the 2022 Odessa report as of June 4, 2022: Report (nerc.com)
  - Other information in the table is summarized from ERCOT's March 8, 2024 update to the IBRWG: Odessa Update_03082024.pptx (live.com)

Modifications discovered and developed after Odessa are being deployed

- The vast majority of the systemic issues identified in Odessa are being resolved through software, settings, and firmware solutions.
- Those solutions are being deployed at the affected IBRs and other IBRs with the same make and model of equipment elsewhere in ERCOT.
- New IBRs coming online with the same make and model of equipment will also have these solutions deployed.

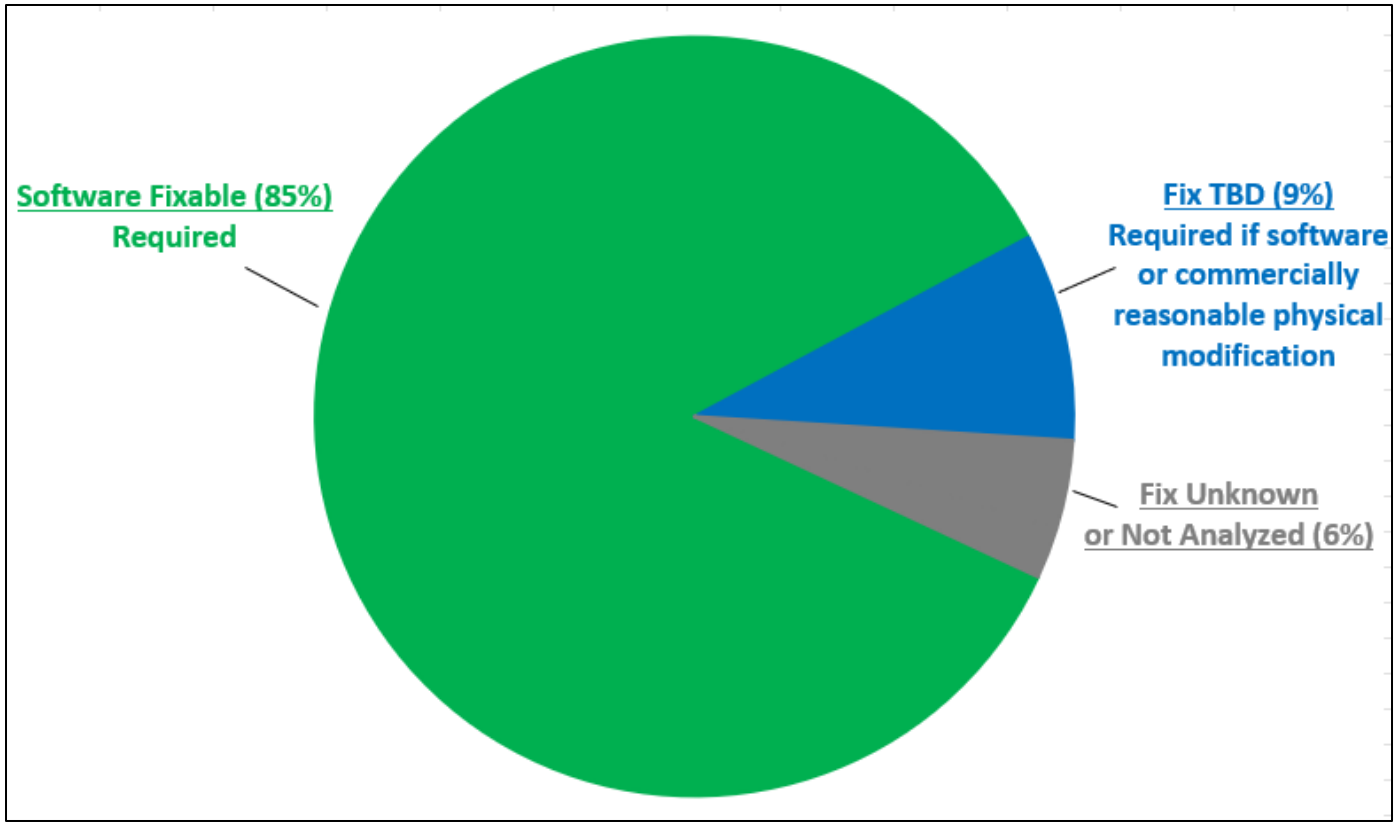
Example: ERCOT market notice from October 2023:
"During the 2022 Odessa Disturbance event in the ERCOT Region, multiple solar facilities with TMEIC Ninja inverters had them trip during the system disturbance due to instantaneous AC overcurrent. **TMEIC identified the problem and developed a solution** that reduces the current spike during a voltage disturbance and improves the ride-through capabilities of the inverters during system disturbances.

In addition, TMEIC has been working with ERCOT and affected Resource Entities (REs) to implement additional inverter settings changes to improve ride-through performance.

ERCOT is requiring all REs owning solar facilities with TMEIC Ninja inverters to consult with TMEIC to determine if the overcurrent mitigation and other ride-through setting changes need to be implemented at their facilities and notify ERCOT of: (i) the results of their findings and (ii) a timeline in which any needed updates will be completed."4 (emphasis added)

Most ride-through issues from past ERCOT events with NERC reports are fixable with software modifications required under the TAC Report

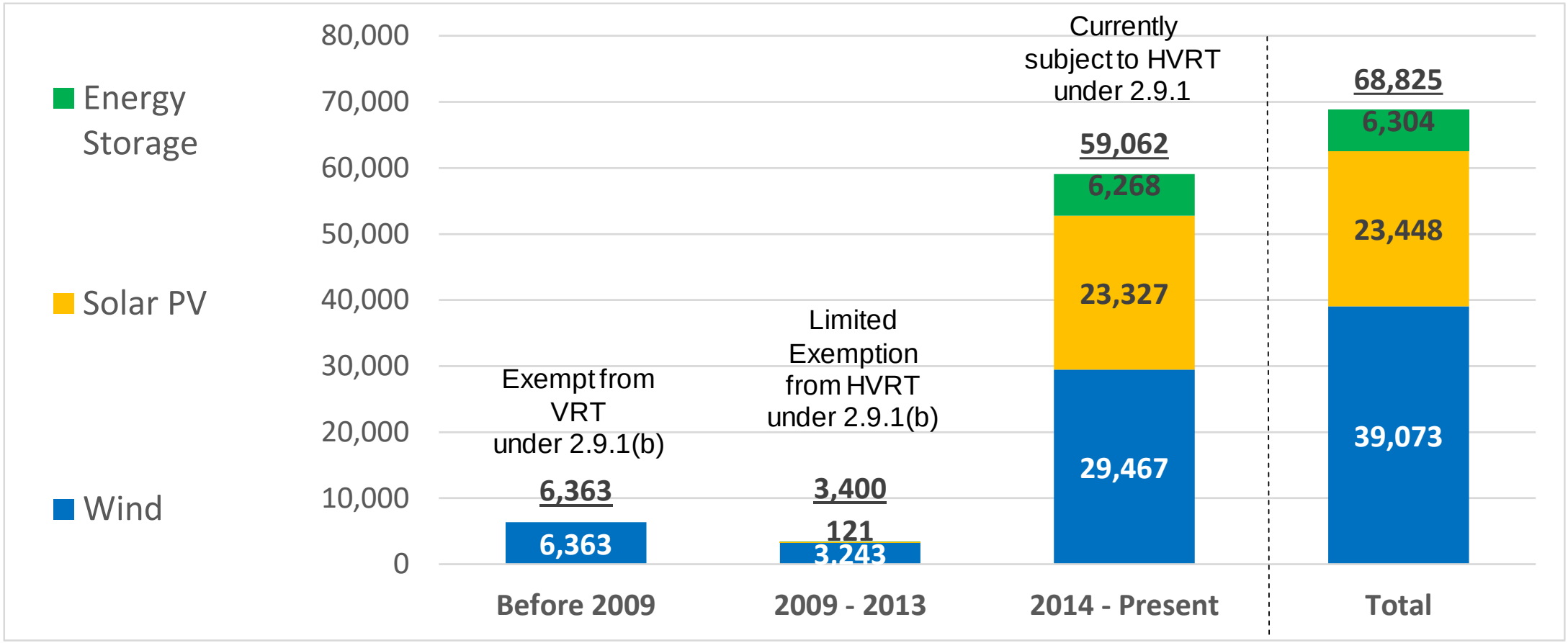
Percentage of past ride-through failures that can be fixed, by method:



Sources and notes:

- Review of the four NERC event reports for ERCOT (Odessa 1, Odessa 2, Panhandle, and November 2023 ("Other") report of prior wind event) and analysis by Dr. Ryan Quint of Elevate Energy Consulting.
- Data exclude consequential tripping, which is not a ride-through failure.

Existing IBRs: Approximate MW Additions (by Install Date) and Current Operating Guide Exemptions (by SGIA Date)



Sources and notes:

- See July 2024 Monthly Outlook for Resource Adequacy report located at https://www.ercot.com/gridinfo/resource.

Where exemptions will be needed, the scope and scale are generally known. Uncertainty about new "specificity" does not equate to widespread exemptions

Proposed Requirement for Existing IBRs	OEM can meet requirement? (% of 67 GW)	Selected ERCOT Comments	TAC Report Requirements
Frequency Ride Through Curve	87%	**"Parameterization, software changes, and minor upgrade kits should be implemented."** "Limited, specific exemptions may be acceptable..."	Requires parameterization and software changes. Commercially reasonable minor upgrade kits are required if available. Allows exceptions for remaining limitations after commercially reasonable modifications are made.
Voltage Ride Through Curves	86%		
Frequency Protection System Coordination	99%	**"...should be achievable with proper parameterization and software changes... "**	Requires parameterization and software changes.
Frequency Current Injection settings	99%		
Frequency Controls System Coordination	99%		
Frequency Filtered quantities/time delay use	99%		
Voltage Protection System Coordination	99%		
Voltage Current Injection settings	95%		
Voltage Controls System Coordination	99%		
Voltage Filtered quantities/time delay use	99%		
Rate of Change of Frequency (RoCoF)	60%	**"Technical feasibility for legacy IBRs reflects challenges."** **"Most IBRs do not actively monitor [ROCOF, ME, PAJ]"** ROCOF: "Most "No" responses from OEMs and REs are due to insufficient information rather than a known limitation" ME, PAJ: "A majority of "No" responses are due to lack of prior testing and verification rather than known limitation for OEMs and REs"	For IBRs that have protection systems installed and activated to trip, the IBR should remove or raise limits to the maximum extent commercially reasonable (including non-physical modifications). Allows exceptions for remaining limitations after software and commercially reasonable physical modifications are made.
Multiple excursion requirements	60%		
Phase Angle Jump requirements	59%		

Source: Presentation by Stephen Solis on NOGRR 245 to TAC, December 4, 2023, Appendix: RFI Results detailed comparison.

ERCOT's previous RFI results provide directional insight into the scope and scale of exemptions that will likely be needed.

- The TAC Report requires modifications expected to yield the most benefit, with exemptions where needed.
- The most uncertainty is for items ERCOT calls "specificity" that are not mentioned in the current applicable sections of the Nodal Operating Guides: ROCOF, multiple excursions, and phase angle jump.
  - Most IBRs do not actively monitor these inputs for tripping.
  - Many OEMs and REs do not have data on underlying limitations for these items, and the older the equipment, the less likely that data will be available.
  - There is no evidence to suggest there is a widespread underlying limitation related to those items.
  - IBRs may only seek exemptions for a known limitation, not a potential one.

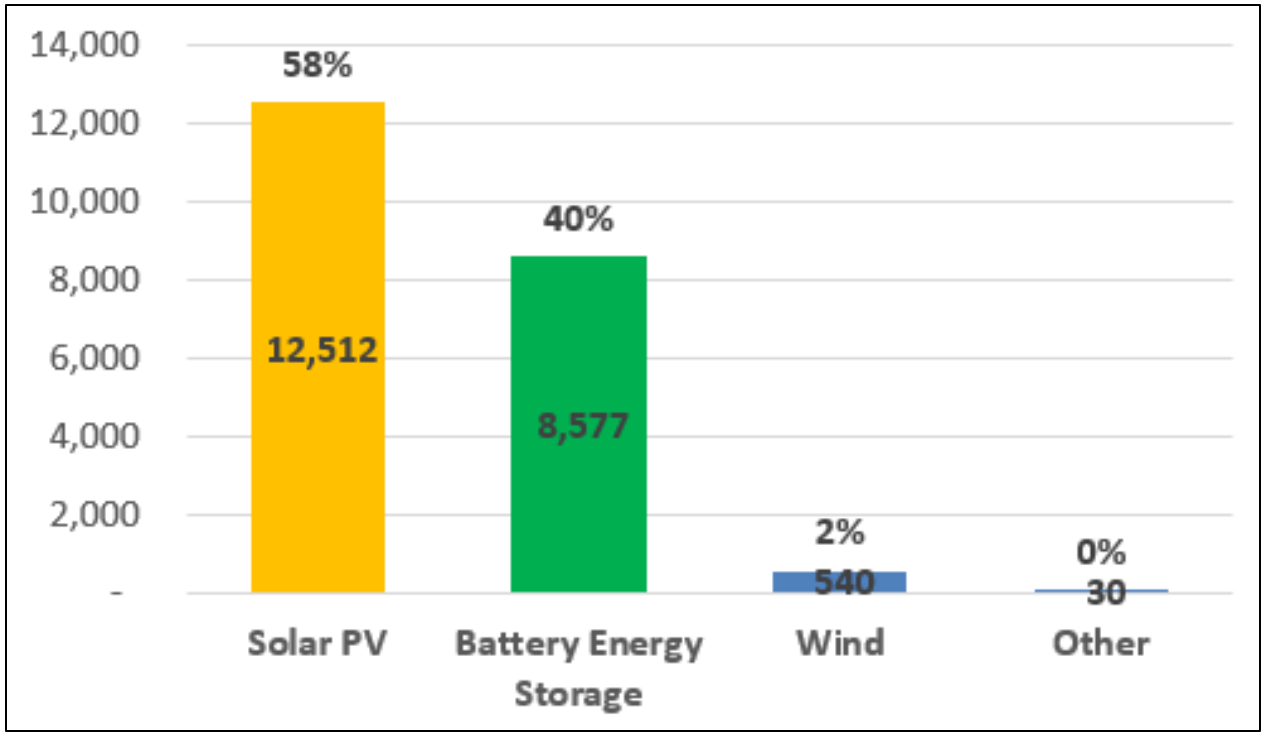
Exemptions from legacy ride-through requirements are necessary for post-1/16/14 SGIA IBRs because the NOGRR245 TAC Report moves to a comprehensive performance-based standard

- The existing Operating Guide expressly addresses frequency and voltage relay settings and certain performance references.
- The TAC Report establishes performance requirements for existing IBRs subject to legacy frequency and voltage ride-through curves.
- The existing Operating Guide has not set a standard that addresses all relevant equipment design decisions for a comprehensive performance-based approach.
- Operational IBRs were approved in ERCOT's interconnection process and ERCOT's modeling requirements have evolved significantly over time.
- Joint Commenters support establishment of performance-based ride-through requirements for existing IBRs and offer more details in the Appendix to clarify the need for exemptions from legacy ride-through requirements.

“20-30 GW” of new IBRs (SGIA 6/1/23 – 6/1/24) are new solar and storage with improved ride-through capabilities

21.7 GW of IBRs with an SGIA = 6/1/2023 - 4/30/2024

MW and % of total MW



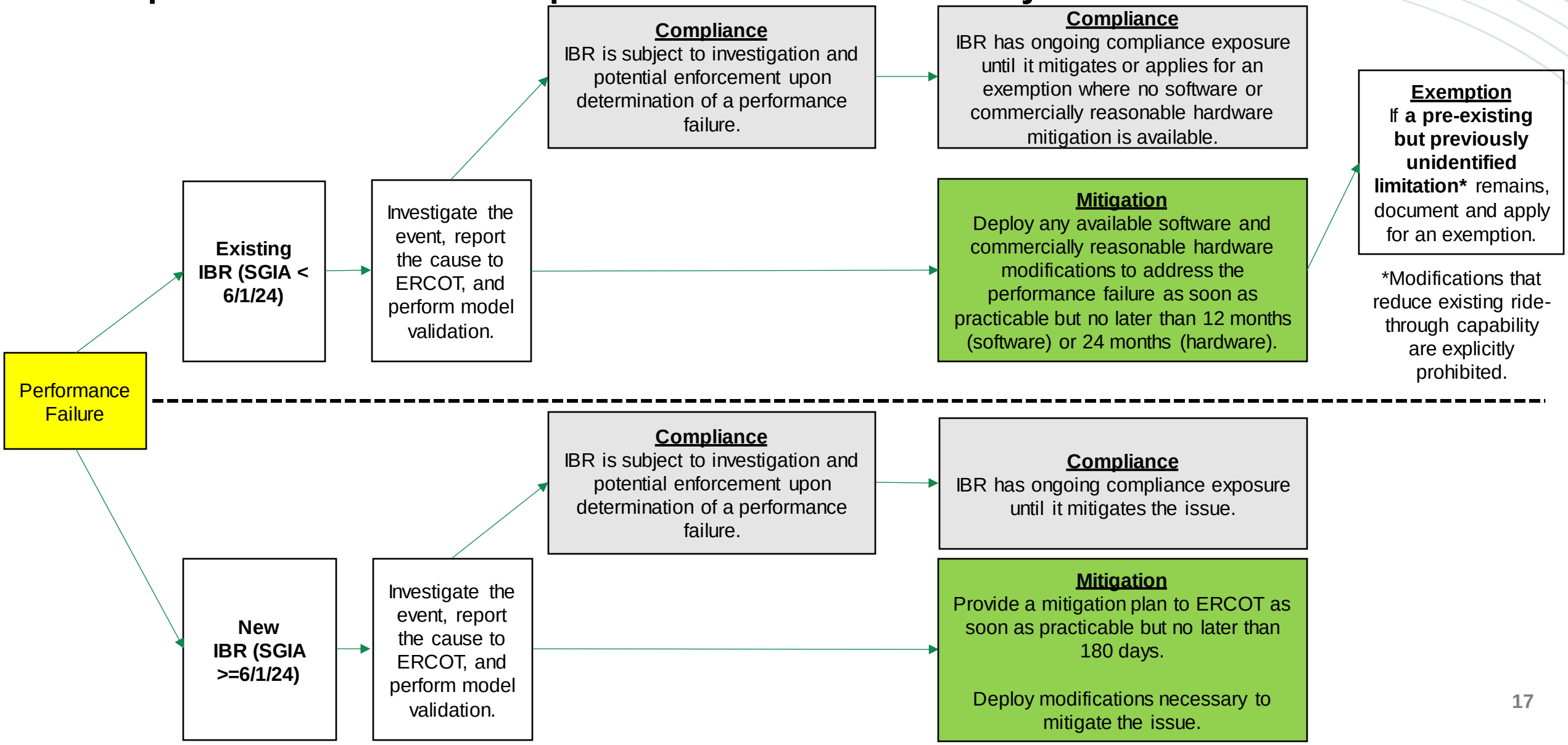
Sources and Notes:

- Data from ERCOT as of May 1, 2024 for Large Generator Interconnections. Includes only projects for which a Full Interconnection Study has been requested. 21.7 GW total across all technologies.

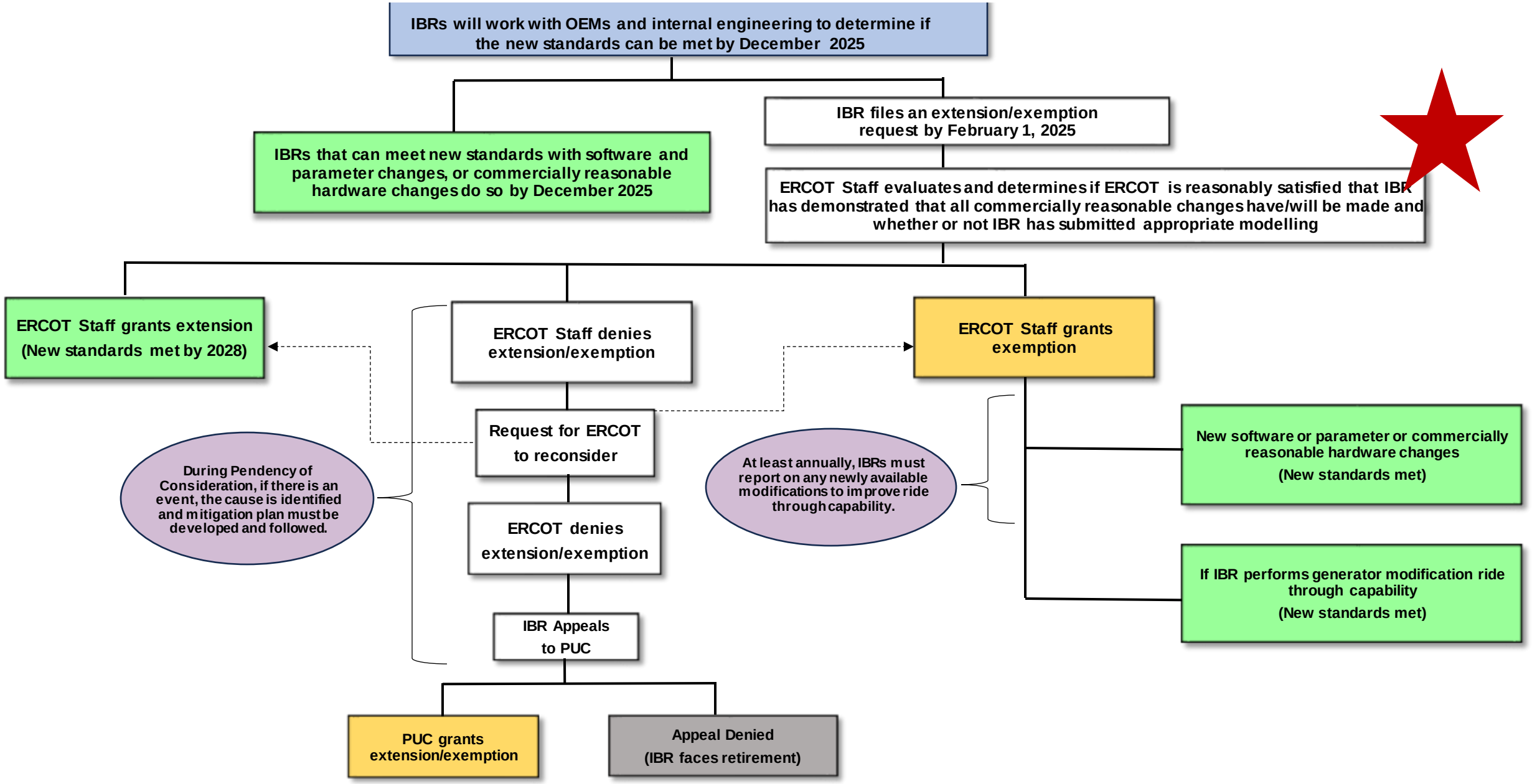
Better capability, regardless of the applicable requirement

- New IBRs are more likely to exceed the “legacy” requirements and to approach or meet the new “preferred” ride-through requirements
  - Technology continues to improve, even if certification lags
    - Few (if any) can certify that they meet IEEE 2800 requirements, since the 2800.2 testing and verification standard is still being developed
  - Known issues are being addressed with new projects. For example, TMEIC and Power Electronics are deploying the post-Odessa modifications or improved equipment on new IBRs coming online.

NOGRR245 TAC Report places a duty on IBRs to mitigate performance failures and preserves ERCOT's compliance enforcement authority



ERCOT Staff can reject exemption requests if they determine a software modification or commercially reasonable physical modification is available.



Basis for Supporting TAC Report

It substantially improves IBR performance requirements for the ERCOT system, setting the strongest reliability standard in the country.

It <u>requires existing IBRs to implement software and firmware upgrades.</u> This means the reliability issues behind the Odessa events will be solved. Reasonable hardware upgrades are also required. For the IBRs that request limited exemptions, ERCOT can deny the exemption if it disagrees with the assessment of commercial reasonability.

It sufficiently addresses reliability risk. No analysis exists that shows that the TAC Report fails to address known reliability risks. It requires reporting that will provide ERCOT with a vastly improved understanding of capabilities and limitations that can serve as the basis for future NOGRRs as needed.

Appendix

Appendix: Four illustrative examples show ERCOT's arbitrarily high cost thresholds exposing existing Resources to multimillion dollar costs for additional modifications.

ERCOT's proposed expenditure requirements per modification from 2.11.1(3)(e)			
Existing Resource SGIA date	SGIA < 1/16/14	SGIA > 1/16/14	
Improvement modification makes to fully meeting the performance requirements	Substantial Improvement	Material Improvement	Substantial Improvement
Required expenditure level per inverter or turbine/converter	20% of the cost to replace	20% of the cost to replace	50% of the cost to replace

Wind examples	Wind Project A	Wind Project B
Cost to replace one converter	$200,000	$200,000
X% of cost	20%	50%
Representative project size, MW	127.5	127.5
Total expenditure required on a representative project, $	**$3,400,000**	**$7,500,000**
Total expenditure required on a representative project, $/MWh for one year	$8.70	$16.79

Solar examples	Solar Project C	Solar Project D
Cost to replace one converter	$75,000	$75,000
X% of cost	20%	50%
Representative project size, MW	252	252
Total expenditure required on a representative project, $	**$4,500,000**	**$11,250,000**
Total expenditure required on a representative project, $/MWh for one year	$8.86	$22.16

Notes:

Total expenditure required on a representative project, $ = # of inverters or converters at a representative project x cost to replace an inverter or converter x [20, 50]%.

Total expenditure required on a representative project, $/MWh = previous answer/MWh generation per year using MW and a capacity factor.

Wind Project A: 85 1.5 MW turbines, 35% capacity factor.

Wind Project B: 75 1.7 MW turbines, 40% capacity factor.

Solar Project C: 300 0.84 MW inverters, 23% capacity factor.

Solar Project D: 300 0.84 MW inverters, 23% capacity factor.

Existing Operating Guide references relay-setting requirements

§ 2.6.2 - Frequency Ride-Through Requirements

2.6 Requirements for **Under-Frequency and Over-Frequency Relaying**

2.6.2 Generators and Energy Storage Resources

(1) Except for Generation Resources subject to Section 2.6.2.1, Frequency Ride-Through Requirements for Distribution Generation Resources (DGRs) and Distribution Energy Storage Resources (DESRs), **if under-frequency relays are installed and activated to trip the Generation Resource, these relays shall be set** such that the automatic removal of individual Generation Resources or Energy Storage Resources (ESRs) from the ERCOT System meets or exceeds the following requirements:

Frequency Range	Delay to Trip
Above 59.4 Hz	No automatic tripping (Continuous operation)
Above 58.4 Hz up to And including 59.4 Hz	Not less than 9 minutes
Above 58.0 Hz up to And including 58.4 Hz	Not less than 30 seconds
Above 57.5 Hz up to And including 58.0 Hz	Not less than 2 seconds
57.5 Hz or below	No time delay required

(2) Except for Generation Resources subject to Section 2.6.2.1, **if over-frequency relays are installed and activated to trip the unit, they shall be set** such that the automatic removal of individual Generation Resources or ESRs from the ERCOT System meets or exceeds the following requirements:

Frequency Range	Delay to Trip
Below 60.6 Hz down to and including 60 Hz	No automatic tripping (Continuous operation)
Below 61.6 Hz down to and including 60.6 Hz	Not less than 9 minutes
Below 61.8 Hz down to and including 61.6 Hz	Not less than 30 seconds
61.8 Hz or above	No time delay required

§ 2.9.1 - Voltage Ride-Through Requirements

(3) **Each IRR or ESR is required to set its voltage relays to remain in service** for at least 0.15 seconds during all transmission faults and to allow the system to recover as illustrated in Figure 1, Default Voltage Ride-Through Boundaries for IRRs and ESRs Connected to the ERCOT Transmission Grid, below. Recovery time to 90% of per unit voltage should be within 1.75 seconds. Faults on individual phases with delayed clearing (zone 2) may result in phase voltages outside this boundary but if the phase voltages remain inside this boundary, **then Resource voltage relays are required to be set to remain connected and recover as illustrated in Figure 1**.

(5) **Each IRR or ESR shall set its voltage relays to remain interconnected to the ERCOT System during the following high-voltage conditions, as illustrated in Figure 1**: any per-unit voltage equal to or greater than 1.175 but less than 1.2 for up to 0.2 seconds, any per-unit voltage equal to or greater than 1.15 but less than 1.175 per unit voltage for up to 0.5 seconds, and any per-unit voltage equal to or greater than 1.1 but less than 1.15 for up to 1.0 seconds. The indicated voltages are measured at the POIB.

Additional context for existing Operating Guide excerpts

Selected ERCOT claims and references to performance in the existing Operating Guides	Responses and context
§ 2.9(3): “During operating conditions listed in paragraph (1) above, each Generation Resource shall not … cease providing real or reactive power except to the extent needed to provide frequency support or aid in voltage recovery."	§ 2.9(3) sets this requirement during operating conditions for which IBRs have been expressly exempted. § 2.9(1) (“**except for Generation Resources subject to Section 2.9.1, Voltage Ride-Through Requirements for IRRs and ESRs Connected to the ERCOT Transmission System** … each Generation Resource and ESR must be designed … to remain connected … during the following operating conditions”).
§ 2.9.1(4): “Each IRR shall remain interconnected during three-phase faults on the ERCOT System for a voltage level as low as zero volts with a duration of 0.15 seconds as measured at the Point of Interconnection Bus (POIB) unless a shorter clearing time requirement for a three-phase fault specific to the generating plant POIB is determined by and documented by the TSP in conjunction with the SGIA. The clearing time requirement shall not exceed nine cycles."	This requirement applies only to a certain portion of the low-voltage ride-through curve.
ERCOT: “Language in Figure 1 in Operating Guide 2.9.1 makes it clear that Intermittent Renewable Resources may not trip for voltages and times indicated in Figure 1.”	§ 2.9.1(3) has conflicting language establishing relay-setting requirements relative to Figure 1 ("but if the phase voltages remain inside this boundary, then Resource **voltage relays are required to be set to remain connected and recover as illustrated in Figure 1**").