

Comment Report

Project Name: 2020-06 Verifications of Models and Data for Generators | Inverter-based, resource-related Glossary Terms
Comment Period Start Date: 9/18/2023
Comment Period End Date: 10/24/2023
Associated Ballots:

There were 39 sets of responses, including comments from approximately 101 different people from approximately 67 companies representing 8 of the Industry Segments as shown in the table on the following pages.

Questions

- 1. Do you support the definition for Power Electronic Device (PED) as proposed, or with non-substantive changes? If you do not support the definition as proposed, please explain the changes that, if made, would result in your support.**
- 2. Do you support the definition for Inverter-Based Resource (IBR) as proposed, or with non-substantive changes? If you do not support the definition as proposed, please explain the changes that, if made, would result in your support.**
- 3. Provide any additional comments for the SDT to consider, if desired.**

Organization Name	Name	Segment(s)	Region	Group Name	Group Member Name	Group Member Organization	Group Member Segment(s)	Group Member Region
BC Hydro and Power Authority	Adrian Andreoiu	1,3,5	WECC	BC Hydro	Hootan Jarollahi	BC Hydro and Power Authority	3	WECC
					Helen Hamilton Harding	BC Hydro and Power Authority	5	WECC
					Adrian Andreoiu	BC Hydro and Power Authority	1	WECC
DTE Energy - Detroit Edison Company	Adrian Raducea	3,5		DTE Energy - DTE Electric	Karie Barczak	DTE Energy - Detroit Edison Company	3	RF
					Adrian Raducea	DTE Energy - Detroit Edison	5	RF
					patricia ireland	DTE Energy	4	RF
WEC Energy Group, Inc.	Christine Kane	3,4,5,6		WEC Energy Group	Christine Kane	WEC Energy Group	3	RF
					Matthew Beilfuss	WEC Energy Group, Inc.	4	RF
					Clarice Zellmer	WEC Energy Group, Inc.	5	RF
					David Boeshaar	WEC Energy Group, Inc.	6	RF
Tacoma Public Utilities (Tacoma, WA)	Jennie Wike	1,3,4,5,6	WECC	Tacoma Power	Jennie Wike	Tacoma Public Utilities	1,3,4,5,6	WECC
					John Merrell	Tacoma Public Utilities (Tacoma, WA)	1	WECC
					John Nierenberg	Tacoma Public Utilities (Tacoma, WA)	3	WECC
					Hien Ho	Tacoma Public Utilities (Tacoma, WA)	4	WECC
					Terry Gifford	Tacoma Public Utilities (Tacoma, WA)	6	WECC
					Ozan Ferrin	Tacoma Public Utilities (Tacoma, WA)	5	WECC

ACES Power Marketing	Jodirah Green	1,3,4,5,6	MRO,RF,SERC,Texas RE,WECC	ACES Collaborators	Bob Soloman	Hoosier Energy Electric Cooperative	1	RF
					Kris Carper	Arizona Electric Power Cooperative, Inc.	1	WECC
					Jason Procuinar	Buckeye Power, Inc.	1,4	RF
					Jolly Hayden	East Texas Electric Cooperative, Inc.	NA - Not Applicable	Texas RE
					Amber Skillern	East Kentucky Power Cooperative	1	SERC
					Scott Brame	North Carolina Electric Membership Corporation	3,4,5	SERC
MRO	Kendra Buesgens	1,2,3,4,5,6	MRO	MRO NSRF	Bobbi Welch	Midcontinent ISO, Inc.	2	MRO
					Christopher Bills	City of Independence Power & Light	3,5	MRO
					Fred Meyer	Algonquin Power Co.	3	MRO
					Jamie Monette	Allete - Minnesota Power, Inc.	1	MRO
					Larry Heckert	Alliant Energy Corporation Services, Inc.	4	MRO
					Marc Gomez	Southwestern Power Administration	1	MRO
					Bryan Sherrow	Kansas City Board Of Public Utilities	1	MRO
					Terry Harbour	MidAmerican Energy	1,3	MRO
					Jamison Cawley	Nebraska Public Power	1,3,5	MRO
					Seth Shoemaker	Muscatine Power &	1,3,5,6	MRO

						Water			
						Michael Brytowski	Great River Energy	1,3,5,6	MRO
						Shonda McCain	Omaha Public Power District	6	MRO
						George Brown	Acciona Energy North America	5	MRO
						Jaimin Patel	Saskatchewan Power Corporation	1	MRO
						Kimberly Bentley	Western Area Power Administration	1,6	MRO
						Jay Sethi	Manitoba Hydro	1,3,5,6	MRO
						Michael Ayotte	ITC Holdings	1	MRO
FirstEnergy - FirstEnergy Corporation	Mark Garza	1,3,4,5,6		FE Voter	Julie Severino	FirstEnergy - FirstEnergy Corporation	1	RF	
					Aaron Ghodooshim	FirstEnergy - FirstEnergy Corporation	3	RF	
					Robert Loy	FirstEnergy - FirstEnergy Solutions	5	RF	
					Mark Garza	FirstEnergy-FirstEnergy	1,3,4,5,6	RF	
					Stacey Sheehan	FirstEnergy - FirstEnergy Corporation	6	RF	
Southern Company - Southern Company Services, Inc.	Pamela Frazier	1,3,5,6	MRO,RF,SERC,Texas RE,WECC	Southern Company	Matt Carden	Southern Company - Southern Company Services, Inc.	1	SERC	
					Joel Dembowski	Southern Company - Alabama Power Company	3	SERC	
					Jim Howell, Jr.	Southern Company - Southern Company Generation	5	SERC	

					Ron Carlsen	Southern Company - Southern Company Generation	6	SERC
					Leslie Burke	Southern Company - Southern Company Generation	5	SERC
Southwest Power Pool, Inc. (RTO)	Shannon Mickens	2	MRO,SPP RE,WECC	SPP RTO	Shannon Mickens	Southwest Power Pool Inc.	2	MRO
					Eddie Watson	Southwest Power Pool Inc.	2	MRO
					Jim Williams	Southwest Power Pool Inc	2	MRO
					Jeff McDiarmid	Southwest Power Pool Inc.	2	MRO
					Dee Edmondson	Southwest Power Pool Inc.	2	MRO
					Eric Sullivan	Southwest Power Pool Inc.	2	MRO
					Brandon Hentschel	Southwest Power Pool Inc.	2	MRO
					Mia Wilson	Southwest Power Pool Inc.	2	MRO
					Doug Bowman	Southwest Power Pool Inc.	2	MRO
					Mason Favazza	Southwest Power Pool Inc.	2	MRO
					Zach Sabey	Southwest Power Pool Inc.	2	MRO
Western Electricity Coordinating Council	Steven Rueckert	10		WECC	Steve Rueckert	WECC	10	WECC
					Phil O'Donnell	WECC	10	WECC

1. Do you support the definition for Power Electronic Device (PED) as proposed, or with non-substantive changes? If you do not support the definition as proposed, please explain the changes that, if made, would result in your support.

Anderson Hoke - National Renewable Energy Laboratory - NA - Not Applicable - NA - Not Applicable

Answer No

Document Name

Comment

It is confusing to define a term PED that excludes loads because increasingly many loads are power electronic devices. Instead, I'd suggest leveraging the definition of "IBR unit" from IEEE 2800, which has nearly the same meaning as PED. The IBR unit definition could be amended by NERC to include STATCOMs etc. if desired.

Likes 0

Dislikes 0

Response

Randall Buswell - VELCO -Vermont Electric Power Company, Inc. - 1

Answer No

Document Name

Comment

The most confusing item is the use of "power electronic interface" in the PED definition because inverters are describes as a PED in the technical rationale. If an inverter is a PED, what is the power electronic interface? The PED definition could be clarified by inserting ", such as an inverter", after "power electronic interface". In addition, we would suggest removing inverters from the technical rationale. If we misunderstood the intent, please explain what is meant by electronic interface.

Likes 0

Dislikes 0

Response

Ben Hammer - Western Area Power Administration - 1,6

Answer No

Document Name

Comment

NERC Glossary of term utilizes "Real Power" but not "active power", "Reactive Power" not "reactive power" and "Load" not "load".

Suggest modification of PED definition to:

Power Electronic Device (PED): Any device connected to the ac power system through a power electronic interface that generates or transmits **Real Power** or **Reactive Power**, or absorbs **Real Power** for the purposes of re-injecting it at a later time. This term excludes any **Load**.

Likes 1

Associated Electric Cooperative, Inc., 3, Bennett Todd

Dislikes 0

Response

Kendra Buesgens - MRO - 1,2,3,4,5,6 - MRO, Group Name MRO NSRF

Answer

No

Document Name

Comment

The MRO NSRF does not support creating the term Power Electronic Device. The term adds minimal value or clarity on its own. In principle, it's a term created for use in defining another term. In practice it almost completely overlaps with the proposed definition of IBR. The MRO NSRF suggests combining power electronic device definition with the definition of inverter-based resource.

Likes 0

Dislikes 0

Response

Srikanth Chennupati - Entergy - 1,3,5,7 - SERC

Answer

No

Document Name

Comment

Entergy agrees with NAGF comments. The NAGF has identified the following comments for consideration regarding the proposed Power Electronic Device (PED) definition:

1. The term "power electronic interface" needs to be clarified as there are multiple definitions of this term.
2. The last sentence "This term excludes any load" needs to be clarified or deleted. A battery energy storage or pumped hydro device are modeled as a load when in the charging/pumping operational modes. Such devices should not be excluded from the PED definition.

Likes 0

Dislikes 0

Response

Adrian Andreoiu - BC Hydro and Power Authority - 1,3,5, Group Name BC Hydro

Answer	No
Document Name	
Comment	
<p>BC Hydro appreciates the drafting team's efforts and the opportunity to comment, and offers the following.</p> <p>The term “power electronic device” is widely used in the power and energy industry to refer to semiconductor devices (e.g., IGBT, Thyristor, MOSFET, BJT, etc.) that are used in power electronic circuits and systems. This term has also been occasionally used to refer to power electronic converters (e.g., inverters, rectifiers, choppers, etc.) that are composed of multiple semiconductor devices. The proposed definition now appears to extend this term to also include other components of a single unit of an Inverter-Based Resource (IBR) along with a range of other devices, including HVDC converters and FACTS devices. As such, it can lead to significant confusion.</p> <p>The proposed definition states that a “Power Electronic Device” is “[any] device connected to the ac power system through a power electronic interface...”. The confusion lies in the fact that the “power electronic interface”, which has been referred to in this definition, is itself recognized by the industry as a power electronic device(s) or composed of power electronic devices.</p> <p>The Standard Drafting Team may consider alternative terms such as IBR Unit (IBRU), Inverter-Based Device (IBD), or Power-Electronic-Interfaced Device (PEID).</p> <p>IBRU has been historically used to refer to the devices that are intended to fall into the scope of the definition. Therefore, its consistent use is not expected to create confusion. IBD, on the other hand, does not appear to have been used extensively in the past. Therefore, it can be defined as a new NERC Glossary Term, which will also minimize confusion.</p> <p>It is recognized that certain FACTS devices are not inverter-based (such as SVC and TCSC). However, BC Hydro is of the opinion that such FACTS devices are better addressed separately, rather than being lumped with the inverter-based devices in a single definition.</p> <p>Alternatively, PEID can be used to cover all devices that have been intended to fall under the scope of the proposed definition. Although longer, this term has the advantage of clarity, because the key term in the definition, i.e., “power electronic interface”, has been retained in the name, thereby avoiding confusion and misinterpretation.</p>	
Likes	0
Dislikes	0
Response	
Duane Franke - Manitoba Hydro - 1,3,5,6 - MRO	
Answer	No
Document Name	
Comment	
<p>Please reference the IEEE definition of IBR and IBR units in the technical rationale.</p>	
Likes	0
Dislikes	0
Response	

George E Brown - Pattern Operators LP - 5

Answer No

Document Name

Comment

Pattern Energy does not believe a standalone glossary term for “power electronic device is required. Please see response to question three. Thank you.

Likes 0

Dislikes 0

Response

Christine Kane - WEC Energy Group, Inc. - 3,4,5,6, Group Name WEC Energy Group

Answer No

Document Name

Comment

WEC Energy Group supports the comments of the NAGF.

Likes 0

Dislikes 0

Response

Israel Perez - Salt River Project - 1,3,5,6 - WECC

Answer No

Document Name

Comment

SRP does not support the addition of this term to the standard. This new term defines IBR's being introduced directly into a standard which previously did not have IBR applicability. SRP strongly feels Inverter Based Resources should have separate standards.

Likes 0

Dislikes 0

Response

Nikki Carson-Marquis - Minnkota Power Cooperative Inc. - 1 - MRO

Answer No

Document Name

Comment

Minnkota Power Cooperative recognizes the need to distinguish individual IBR “devices” and the “resource/facility” with a term similar to IEEE’s “IBR unit”. However, Minnkota opposes the proposed definition of PED, as well as the title of this term “Power Electronic Device”.

The proposed definition for PED is much too broad, as there are many different types of devices that use power electronics, not all of which are relevant to generation resources. The proposed definition should also include more detail for determining which devices that have power electronics are PEDs and which devices do not have PEDs. While the SDT’s technical rationale provides some clarification as to which types of devices are considered PED, this level of detail is missing from the proposed definition.

Additionally, Minnkota opposes the proposed title of “Power Electronic Device”. This term is already in broad use within industry, and industry usage of this term is not limited to IBR. The title of the proposed term should be more specific to IBR, perhaps “IBR Device”, “Inverter Based Device (IBD)”, or even IEEE’s “IBR Unit”. While Minnkota acknowledges the SDT’s reasoning that IEEE is a different entity with a different focus, Minnkota believes IEEE’s “IBR Unit” term more clearly indicates that this term is limited to devices used within an IBR context than the proposed PED term, and the SDT should reconsider using the “IBR Unit” term. If, in the SDT’s view, IEEE’s definition of “IBR Unit” conflicts with the purpose of “PED”, it should be explained in more detail.

Likes 0

Dislikes 0

Response

Adrian Raducea - DTE Energy - Detroit Edison Company - 3,5, Group Name DTE Energy - DTE Electric

Answer No

Document Name

Comment

No, definition is too much overlap to IBR definition.

Likes 0

Dislikes 0

Response

Chantal Mazza - Hydro-Quebec (HQ) - 1 - NPCC

Answer No

Document Name	
Comment	
<p>The definition of PED mentions that it “generates or transmits both active and reactive power” while the definition for IBR mentions that it “supplies primarily active power”. As mentioned, an HVDC or FACTS device is excluded from the term IBR, but is considered a PED. Therefore, the definition of IBR should mention that it is a type of PED and not a collection of PED. This modification doesn’t exclude the possibility to have multiple PED together to form a single bigger resource.</p> <p>Power Electronic Device (PED): Any device incorporating a power electronic interface for connection to the ac power system that generates or transmits active power or reactive power or absorbs active power for the purposes of re-injecting it later. This term excludes any load.</p> <p>The most confusing item is the use of “power electronic interface” in the PED definition because inverters are describing as a PED in the technical rationale. If an inverter is a PED, what is the power electronic interface? The PED definition could be clarified by inserting “, such as an inverter”, after “power electronic interface”. In addition, we would suggest removing inverters from the technical rationale. If we misunderstood the intent, please explain what is meant by electronic interface.</p>	
Likes	0
Dislikes	0
Response	
<p>Pamela Frazier - Southern Company - Southern Company Services, Inc. - 1,3,5,6 - MRO,WECC,Texas RE,SERC,RF, Group Name Southern Company</p>	
Answer	No
Document Name	
Comment	
<p>There is no clear definition of power electronic interface in provided technical rationale. Loads can also be defined as PEDs i.e., BESS during charging mode. The last sentence of the proposed definition should be removed.</p>	
Likes	0
Dislikes	0
Response	
<p>Wayne Sipperly - North American Generator Forum - 5 - MRO,WECC,Texas RE,NPCC,SERC,RF</p>	
Answer	No
Document Name	
Comment	

The NAGF has identified the following comments for consideration regarding the proposed Power Electronic Device (PED) definition:

- a) The term “power electronic interface” needs to be clarified as there are multiple definitions of this term.
- b) The last sentence “This term excludes any load” needs to be clarified or deleted. A battery energy storage or pumped hydro device are modeled as a load when in the charging/pumping operational modes. Such devices should not be excluded from the PED definition.

Likes 0

Dislikes 0

Response

Junji Yamaguchi - Hydro-Quebec (HQ) - 1,5

Answer

No

Document Name

Comment

The definition of PED mentions that it “generates or transmits both active and reactive power” while the definition for IBR mentions that it “supplies primarily active power”. As mentioned, an HVDC or FACTS device is excluded from the term IBR, but is considered a PED. Therefore, the definition of IBR should mention that it is a type of PED and not a collection of PED. This modification doesn’t exclude the possibility to have multiple PED together to form a single bigger resource.

Power Electronic Device (PED): Any device incorporating a power electronic interface for connection to the ac power system that generates or transmits active power or reactive power or absorbs active power for the purposes of re-injecting it later. This term excludes any load.s

The most confusing item is the use of “power electronic interface” in the PED definition because inverters are describing as a PED in the technical rationale. If an inverter is a PED, what is the power electronic interface? The PED definition could be clarified by inserting “, such as an inverter”, after “power electronic interface”. In addition, we would suggest removing inverters from the technical rationale. If we misunderstood the intent, please explain what is meant by electronic interface.

Likes 0

Dislikes 0

Response

Kimberly Turco - Constellation - 5,6

Answer

No

Document Name

Comment

Constellation supports NAGF comments.

Kimberly Turco on behalf of Constellation Segments 5 and 6

Likes 0

Dislikes 0

Response

Hillary Creurer - Allete - Minnesota Power, Inc. - 1

Answer

No

Document Name

Comment

Minnesota Power supports MRO's NERC Standards Review Forum's (NSRF) comments.

Likes 0

Dislikes 0

Response

Alison MacKellar - Constellation - 5,6

Answer

No

Document Name

Comment

Constellation supports NAGF comments.

Alison Mackellar on behalf of Constellation Segments 5 and 6

Likes 0

Dislikes 0

Response

Charles Yeung - Southwest Power Pool, Inc. (RTO) - 2 - MRO,WECC

Answer

No

Document Name

Comment

There is no explanation of what purpose the term PED is intended to serve within MOD-026-2 and possibly other standards. Without understanding the concern the term is intended to address, it is unclear whether there is a need for this to be a defined term. Rather than use this defined term in the IBR definition, using "power electronic interface" is sufficient to complete the IBR definition.

If the PED term is retained, the ISO RTO Council Standards Review Committee (SRC) recommends that the definition be clarified to address the identified ambiguities to ensure that there are no gaps in what the defined terms cover. In addition we do not agree with the phrase “This term excludes any load” in the definition. Though we agree that “PED” does not include traditional load, stating this in the definition can be confusing because BESS in a charging state needs to be modeled as load. We recommend leaving that phrase out of the definition and instead discussing this topic in the Technical Rationale & Considerations. The proposed definition of PED already states that the device generates or transmits electric energy and therefore cannot be a traditional load. Further, it is not good practice to use exclusionary language in a definition. It would be preferred that more descriptive words be added to more clearly eliminate load as PED.

It is also unclear why the SDT used the undefined terms “active power” and “reactive power” in the proposed definition instead of using the existing NERC glossary terms Real Power and Reactive Power. Using undefined terms when suitable defined terms already exist may result in ambiguity and make the definition less effective; the SRC therefore recommends the use of existing defined terms. If the SDT intends “active power” and “reactive power” to mean something different from Real Power and Reactive Power, the SRC recommends that the SDT use different terms and clarify the intended meaning. The proposed definition also lacks clarity regarding whether a combination of multiple pieces of modular equipment of the same type would be considered a single PED or an aggregation of PEDs.

Likes 0

Dislikes 0

Response

Kennedy Meier - Electric Reliability Council of Texas, Inc. - 2

Answer

No

Document Name

Comment

ERCOT joins the comments submitted by the ISO/RTO Council (IRC) Standards Review Committee (SRC) and adopts them as its own.

Likes 0

Dislikes 0

Response

Shannon Mickens - Southwest Power Pool, Inc. (RTO) - 2 - MRO,WECC, Group Name SPP RTO

Answer

No

Document Name

Comment

SPP has a concern that the term **Power Electronic Device (PED)** does not have a true definition implemented in the IEEE 2800 Standard. For the record, the term was only found once in the document (on page 134) to where there was no definition associated, but only a description. At this point, it is not clear on what the drafting team is suggesting in reference to the relationship of the PED and the IBR. We recommend that the drafting team

provide clarity around their expectations for the PED term and how it aligns with the IBR from a NERC Reliability Standard perspective.

Furthermore, we recommend that the IRPTF coordinates with the IEEE 2800 drafting team and ensure that this proposed term is included in the IEEE Standard to promote consistency with the proposed Glossary of Terms definition.

Moreover, we recommend that the IRPTF coordinates with NERC legal to ensure that the proposed definition is included in the NERC Rules of Procedures (RoP) Appendix 2A to ensure proper alignment with the other two documents.

Additionally, we recommend that the proposed term **not be capitalized** at the point. This current action will create confusion for the industry on the current status of the term. For clarity, a defined term is only capitalized when it has officially been added to the NERC Glossary of Terms.

Finally, we recommend that the IRPTF create educational opportunities for industry to understand the relationship and purpose of the IEEE Standards and how they align with the NERC Standards to help support the reliability needs of the grid. From our perspective, there's no situational awareness around the alignment of the documents.

Likes 0

Dislikes 0

Response

C. A. Campbell - LS Power Development, LLC - 5

Answer

No

Document Name

Comment

LS Power Development agrees with the comments submitted by the North American Generator Forum (NAGF).

Likes 0

Dislikes 0

Response

Andy Thomas - Duke Energy - 1,3,5,6 - SERC,RF

Answer

Yes

Document Name

Comment

None.

Likes 0

Dislikes 0

Response

Shengen Chen - RLC Engineering - NA - Not Applicable - NPCC

Answer Yes

Document Name

Comment

This definition will cover broader devices that using power eletronic.

Likes 0

Dislikes 0

Response

Mark Garza - FirstEnergy - FirstEnergy Corporation - 1,3,4,5,6, Group Name FE Voter

Answer Yes

Document Name

Comment

FirstEnergy supports EEI's comments which state:

EEI does not oppose the proposed new term "Power Electronic Device" (PED). While we do not oppose the proposed new term, we offer the following edits in boldface for consideration:

Power Electronic Device (PED): Any device **incorporating** a power electronic **interface for connection to the Bulk Power System** that generates or transmits active power or reactive power or absorbs active power for the purposes of re-injecting it at a later time.

Likes 0

Dislikes 0

Response

Mark Gray - Edison Electric Institute - NA - Not Applicable - NA - Not Applicable

Answer Yes

Document Name

Comment

EEI does not oppose the proposed new term "Power Electronic Device" (PED). While we do not oppose the proposed new term, we offer the following edits in boldface for consideration:

Power Electronic Device (PED): Any device **incorporating** a power electronic interface **for connection to the Bulk Power System** that generates or

transmits active power or reactive power or absorbs active power for the purposes of re-injecting it at a later time.

Likes 0

Dislikes 0

Response

Daniela Atanasovski - APS - Arizona Public Service Co. - 1,3,5,6

Answer

Yes

Document Name

Comment

AZPS does not oppose the proposed new term "Power Electronic Device" (PED). While we do not oppose the proposed new term, we support the following edits submitted by EEI on behalf of their members.

Power Electronic Device (PED): Any device **connected to the ac power system through incorporating** a power electronic interface **for connection to the Bulk Power System** that generates or transmits active power or reactive power or absorbs active power for the purposes of re-injecting it at a later time.

Likes 0

Dislikes 0

Response

Anna Todd - Southern Indiana Gas and Electric Co. - 3,5,6 - RF

Answer

Yes

Document Name

Comment

N/A

Likes 0

Dislikes 0

Response

Thomas Foltz - AEP - 3,5,6

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Steven Rueckert - Western Electricity Coordinating Council - 10, Group Name WECC

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Cain Braveheart - Bonneville Power Administration - 1,3,5,6 - WECC

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Rachel Coyne - Texas Reliability Entity, Inc. - 10

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Diana Aguas - CenterPoint Energy Houston Electric, LLC - 1 - Texas RE

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Jennie Wike - Tacoma Public Utilities (Tacoma, WA) - 1,3,4,5,6 - WECC, Group Name Tacoma Power

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Jodirah Green - ACES Power Marketing - 1,3,4,5,6 - MRO,WECC,Texas RE,SERC,RF, Group Name ACES Collaborators

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Gail Elliott - International Transmission Company Holdings Corporation - NA - Not Applicable - MRO,RF

Answer

Document Name

Comment

No response received from Subject Matter Experts

Likes 0

Dislikes 0

Response

2. Do you support the definition for Inverter-Based Resource (IBR) as proposed, or with non-substantive changes? If you do not support the definition as proposed, please explain the changes that, if made, would result in your support.

C. A. Campbell - LS Power Development, LLC - 5

Answer No

Document Name

Comment

LS Power Development agrees with the comments submitted by the North American Generator Forum (NAGF).

Likes 0

Dislikes 0

Response

Shannon Mickens - Southwest Power Pool, Inc. (RTO) - 2 - MRO,WECC, Group Name SPP RTO

Answer No

Document Name

Comment

SPP has concerns when it comes to the proposed **IBR definition**. One of our concerns pertain to the IEEE definition and the proposed Glossary definition not having similar language.

Moreover, we have a concern on the how these definitions align with the FERC definition as well as what the Technical Rationale states that the glossary of terms and IEEE definitions "has different focus." We recommend that the IRPTF provide clarity on how this different focus doesn't create reliability concerns when it comes to the coordination of the IEEE and NERC Standards.

Again, we recommend that the IRPTF coordinates with the IEEE 2800 drafting team and ensure that this proposed term aligns with the IEEE Standard to promote consistency with the NERC Glossary of Terms.

Furthermore, we recommend that the IRPTF coordinates with NERC legal to ensure that the proposed definition is included in the NERC Rules of Procedures (RoP) Appendix 2A to ensure proper alignment with the other documents.

Also, we recommend that the IRPTF coordinates with the PRC-024 drafting team to ensure that the new performance based standard clearly addresses how an IBR is defined, while, addressing the need of the IBR performance during a system disturbance.

Finally, we recommend that the IRPTF create educational opportunities for industry to understand the relationship and purpose of the IEEE standards and how they align with the NERC Standards to help support the reliability needs of the grid. From our perspective, there's no situational awareness around the alignment of the documents.

Likes 0

Dislikes 0

Response

Kennedy Meier - Electric Reliability Council of Texas, Inc. - 2

Answer No

Document Name

Comment

ERCOT joins the comments submitted by the IRC SRC and adopts them as its own.

Likes 0

Dislikes 0

Response

Charles Yeung - Southwest Power Pool, Inc. (RTO) - 2 - MRO,WECC

Answer No

Document Name

Comment

The SRC recommends that the drafting team leverage definitions from IEEE 2800 as much as possible instead of creating new definitions. The IEEE 2800 definitions of IBR Unit and IBR Plant are particularly useful, and the SDT should strongly consider defining these terms using the IEEE 2800 definitions, modified as necessary to align with the structure of NERC Reliability Standards. The SRC recognizes that the IEEE definitions may not be a perfect fit for the NERC Reliability Standards, but the SRC believes that the concepts that the IEEE definitions capture will be useful for delineating which Reliability Standard requirements apply to individual units (such as some of the requirements proposed in PRC-028-1) and which requirements apply to IBR Plants as a whole. Therefore, the SRC believes that using the IEEE 2800 definitions as the NERC definitions as much as possible would result in clearer definitions and minimize potential gaps in coverage.

Due to the emergence of inverter-based distributed energy resources connected to distribution systems, a general understanding of the term IBR has arisen in industry that encompasses resources that do not connect to the Bulk-Power System (BPS). Including a reference to BPS connectivity in the NERC definition for IBR may cause confusion, since the term "IBRs" is commonly used to refer to any DC-based energy devices regardless of whether they connect to the BPS or to the distribution system. To avoid this potential confusion, the SRC recommends that the definition for the term not include any references to the BPS. Reliability Standards can refer to "IBRs connected to the BPS" in order to avoid exceeding NERC's authority without using a nonstandard, confusing definition of the term IBR.

It is also confusing to state an IBR "operates as a single resource." We support the need to distinguish this capability however, the term as written can be misinterpreted to mean that the definition is not applicable when an IBR is designed to operate in aggregate (instead of as a single resource) through a collector configuration such as what is identified in the I4 BES Inclusion. Instead, better wording to define the combination of PED(s) (or power electronic interfaces") to form a single IBR would be "taken together constitutes a single resource." It is also unclear why the IBR definition is limited to devices primarily supplying active power when the PED definition includes resources providing active or reactive power.

Likes 0

Dislikes 0

Response

Jodirah Green - ACES Power Marketing - 1,3,4,5,6 - MRO,WECC,Texas RE,SERC,RF, Group Name ACES Collaborators

Answer No

Document Name

Comment

We applaud the efforts of the SDT to develop a definition for IBRs. We believe this is a welcome improvement that will add clarity to multiple Reliability Standards. We believe the initial draft of the proposed IBR definition is a valiant attempt to define a broad range of various technologies; however, we have concerns with the last bullet point of the Technical Rationale section which states:

“Battery energy storage system (BESS) will be considered as a PED/IBR independent of whether or not the device is operating in the charging or discharging mode.”

This statement seems to contradict the caveat added in the IBR definition “supplies primarily active power”. A BESS system by its very nature will likely be supplying active power <=50% of the time that it is in operation. To wit, charging rates may be less than discharge rates, thereby causing the BESS to be absorbing active power over a longer time frame than it is supplying active power. Considering this, how would a BESS be considered to be primarily supplying active power? We feel that additional clarification is needed to specifically address BESSs.

Likes 0

Dislikes 0

Response

Alison MacKellar - Constellation - 5,6

Answer No

Document Name

Comment

The definition expands the definition of qualified units required under NERC standards.

Alison Mackellar on behalf of Constellation Segments 5 and 6

Likes 0

Dislikes 0

Response

Hillary Creurer - Allele - Minnesota Power, Inc. - 1

Answer	No
Document Name	
Comment	
Minnesota Power supports MRO's NERC Standards Review Forum's (NSRF) comments.	
Likes 0	
Dislikes 0	
Response	
Kimberly Turco - Constellation - 5,6	
Answer	No
Document Name	
Comment	
The definition expands the definition of qualified units required under NERC standards.	
Kimberly Turco on behalf of Constellation Segments 5 and 6	
Likes 0	
Dislikes 0	
Response	
Junji Yamaguchi - Hydro-Quebec (HQ) - 1,5	
Answer	No
Document Name	
Comment	
The definition on its own does not exclude HVDC systems. It may be a good idea to add a specific exclusion like the PED definition. For example, add: "This term excludes HVDC systems". Alternatively, starting the definition with "Any electric power resource" could make it clearer that we are not simply referring to a device that transmits electric power.	
Likes 0	
Dislikes 0	
Response	

Wayne Sipperly - North American Generator Forum - 5 - MRO,WECC,Texas RE,NPCC,SERC,RF

Answer No

Document Name

Comment

The NAGF has identified the following comments for consideration regarding the proposed Inverter-Based Resource (IBR) definition:

a) Remove the term “Bulk Power System” and replace with “electrical system”. The NAGF is concerned that using the BPS term in the proposed definition will not apply to Distributed Energy Resources (DER). The NAGF notes that an IBR is an IBR regardless of the level of the interconnection. It is important that NERC develop DER and IBR definitions that work together and do not cause conflict/confusion.

b) Additional information is needed to understand how the IBR definition will impact the devices/facilities under the new GO/GOP-IBR registration categories.

c) Consider adding the following language to the proposed IBR definition: “An IBR plant/facility includes the Power Electronic Devices, and the equipment designed primarily for delivering the power to a common point of connection (e.g. step-up transformers, collector system(s), main power transformer(s), and power plant controller(s)). “

Likes 0

Dislikes 0

Response

Pamela Frazier - Southern Company - Southern Company Services, Inc. - 1,3,5,6 - MRO,WECC,Texas RE,SERC,RF, Group Name Southern Company

Answer No

Document Name

Comment

IBR definition, as proposed, excludes other than BPS systems that IBR are currently connected to i.e., DER. We suggest using “electrical system” in place of “Bulk Power System”.

The reactive power production capability of inverter based resources is just as important as the real power production, so the phrase “supplies primarily active power” is inaccurate.

Likes 0

Dislikes 0

Response

Chantal Mazza - Hydro-Quebec (HQ) - 1 - NPCC

Answer No

Document Name

Comment

The definition on its own does not exclude HVDC systems. It may be a good idea to add a specific exclusion like the PED definition. For example, add: "This term excludes HVDC systems". Alternatively, starting the definition with "Any electric power resource" could make it clearer that we are not simply referring to a device that transmits electric power.

Likes 0

Dislikes 0

Response

Adrian Raducea - DTE Energy - Detroit Edison Company - 3,5, Group Name DTE Energy - DTE Electric

Answer

No

Document Name**Comment**

No, there is too much overlap to PED definition.

Likes 0

Dislikes 0

Response

Nikki Carson-Marquis - Minnkota Power Cooperative Inc. - 1 - MRO

Answer

No

Document Name**Comment**

Minnkota Power supports the MRO New Standard Review Forum (NSRF) and ACES comments. Minnkota believes formally defining "Inverter-Based Resource (IBR)" is the correct path forward and thanks the SDT for their efforts on the initial proposed definition.

Likes 0

Dislikes 0

Response

Israel Perez - Salt River Project - 1,3,5,6 - WECC

Answer

No

Document Name	
Comment	
SRP does not support the addition of this term to the standard. This new term defines IBR's being introduced directly into a standard which previously did not have IBR applicability. SRP strongly feels Inverter Based Resources should have separate standards.	
Likes 0	
Dislikes 0	
Response	
Christine Kane - WEC Energy Group, Inc. - 3,4,5,6, Group Name WEC Energy Group	
Answer	No
Document Name	
Comment	
WEC Energy Group supports the comments of the NAGF.	
Likes 0	
Dislikes 0	
Response	
George E Brown - Pattern Operators LP - 5	
Answer	No
Document Name	
Comment	
Please see response to question three. Thank you.	
Likes 0	
Dislikes 0	
Response	
Duane Franke - Manitoba Hydro - 1,3,5,6 - MRO	
Answer	No
Document Name	
Comment	

1. IBR should be independent of whether it is connected to the Bulk Power System or not. 2. In IEEE defined IBR, the IBR with the dedicated VSC-HVDC all belongs to IBR. I am not sure whether it is the same for the NERC-defined IBR. Please clarify.

Likes 0

Dislikes 0

Response

Kendra Buesgens - MRO - 1,2,3,4,5,6 - MRO, Group Name MRO NSRF

Answer

No

Document Name

Comment

The MRO NSRF does not agree with the Inverter-Based Resource (IBR) definition. Resource is not well defined or constrained, which isn't typically an issue when the term is used in other locations, but here, it could lead to overlap between IBR and IBR facility/plant. "Connects to the BPS" shouldn't be included in the definition, as a device being connected (or not) to the BPS doesn't actually change what it is, and things not connected to the BPS aren't subject to standards anyways. The phrase "supplies primarily active power" is also not well defined and probably not even needed. The last sentence shouldn't even be considered for inclusion as part of the definition for IBR, as it doesn't define IBR in any way, it just stipulates what may be considered an IBR plant/facility, something like this would be best placed in technical rationale or its own definition.

Likes 0

Dislikes 0

Response

Ben Hammer - Western Area Power Administration - 1,6

Answer

No

Document Name

Comment

NERC Glossary of term utilizes "Real Power" but not "active power".

Suggest modification of PED definition to:

Inverter-Based Resource (IBR): Any source of electric power consisting of one or more Power Electronic Devices (PEDs), that operates as a single resource, supplies primarily **Real Power**, and connects to the Bulk Power System. An IBR plant/facility includes the Power Electronic Devices, and the equipment designed primarily for delivering the power to a common point of connection (e.g. step-up transformers, collector system(s), main power transformer(s), and power plant controller(s)).

Likes 0

Dislikes 0

Response	
Anderson Hoke - National Renewable Energy Laboratory - NA - Not Applicable - NA - Not Applicable	
Answer	No
Document Name	
Comment	
Generally the definition is good. But why define IBR to include only BPS-connected plants? A distribution- or subtransmission-connected IBR is still an IBR. Instead, just leave BPS out of the definition of IBR, but clarify in the main document which IBRs the requirements you are writing apply to. (For example you could say in the main document that the requirements apply to BPS-connected IBRs, if that is the intent.)	
Likes	0
Dislikes	0

Response	
Diana Aguas - CenterPoint Energy Houston Electric, LLC - 1 - Texas RE	
Answer	Yes
Document Name	
Comment	
<p>We recognize that some older IBR units may not have the capability to provide reactive power. Nevertheless, CEHE would like to include the revision below to the IBR definition for completeness. CEHE proposes the following revision to the IBR definition for consideration:</p> <p>Any source of electric power consisting of one or more Power Electronic Devices (PEDs), that operates as a single resource, supplies primarily active power, provides reactive power to support system voltage if capable and connects to the Bulk Power System. An IBR plant/facility includes the Power Electronic Devices, and the equipment designed primarily for delivering the power to a common point of connection (e.g., step-up transformers, collector system(s), main power transformer(s), and power plant controller(s)).</p>	
Likes	0
Dislikes	0

Response	
Anna Todd - Southern Indiana Gas and Electric Co. - 3,5,6 - RF	
Answer	Yes
Document Name	
Comment	

N/A

Likes 0

Dislikes 0

Response

Daniela Atanasovski - APS - Arizona Public Service Co. - 1,3,5,6

Answer

Yes

Document Name

Comment

While AZPS does not oppose the proposed definition of IBR, we do support the proposed changes submitted by EEI on behalf of their members. The last sentence of the proposed definition seems to add a definition within a definition. If there is a belief that IBR plant/Facility needs to be defined, an additional definition should be developed. We also suggest adding reactive power to the definition. All of our suggested changes are in boldface below:

Inverter-Based Resource (IBR): Any source of electric power consisting of one or more Power Electronic Devices (PEDs), that operates as a single resource, supplies primarily active power, and connects to the Bulk Power System. (Strikethrough/remove- **An IBR plant/facility includes the Power Electronic Devices, and the equipment designed primarily for delivering the power to a common point of connection (e.g. step-up transformers, collector system(s), main power transformer(s), and power plant controller(s)).**)

Likes 0

Dislikes 0

Response

Mark Gray - Edison Electric Institute - NA - Not Applicable - NA - Not Applicable

Answer

Yes

Document Name

Comment

While EEI does not oppose the proposed definition of IBR, we do suggest some changes. The last sentence of the proposed definition seems to add a definition within a definition. If there is a belief that IBR plant/Facility needs to be defined, an additional definition should be developed. Suggest deleting the last sentence, see below:

Inverter-Based Resource (IBR): Any source of electric power consisting of one or more Power Electronic Devices (PEDs), that operates as a single resource, supplies primarily active power, and connects to the Bulk Power System.

Likes 0

Dislikes 0

Response	
Mark Garza - FirstEnergy - FirstEnergy Corporation - 1,3,4,5,6, Group Name FE Voter	
Answer	Yes
Document Name	
Comment	
<p>While EEI does not oppose the proposed definition of IBR, we do suggest some changes. The last sentence of the proposed definition seems to add a definition within a definition. If there is a belief that IBR plant/Facility needs to be defined, an additional definition should be developed. We also suggest adding reactive power to the definition.</p> <p>Inverter-Based Resource (IBR): Any source of electric power consisting of one or more Power Electronic Devices (PEDs), that operates as a single resource, supplies primarily active power, and connects to the Bulk Power System.</p>	
Likes	0
Dislikes	0
Response	
Srikanth Chennupati - Entergy - 1,3,5,7 - SERC	
Answer	Yes
Document Name	
Comment	
<p>Entergy agrees with NAGF. NAGF has identified the following comments for consideration regarding the proposed Inverter- Based Resource (IBR) definition:</p> <p>a) Remove the term “Bulk Power System” and replace with “electrical system”. The NAGF is concerned that using the BPS term in the proposed definition will not apply to Distributed Energy Resources (DER). The NAGF notes that an IBR is an IBR regardless of the level of the interconnection. It is important that NERC develop DER and IBR definitions that work together and do not cause conflict/confusion.</p> <p>b) Additional information is needed to understand how the IBR definition will impact the devices/facilities under the new GO/GOP-IBR registration categories.</p>	
Likes	0
Dislikes	0
Response	
Andy Thomas - Duke Energy - 1,3,5,6 - SERC,RF	
Answer	Yes

Document Name	
Comment	
None.	
Likes 0	
Dislikes 0	
Response	
Randall Buswell - VELCO -Vermont Electric Power Company, Inc. - 1	
Answer	Yes
Document Name	
Comment	
The definition on its own does not exclude HVDC systems. It may be a good idea to add a specific exclusion similar to the PED definition. For example, add: "This term excludes HVDC systems". Alternatively, starting the definition with "Any electric power resource" could make it clearer that we are not simply referring to a device that transmits electric power.	
Likes 0	
Dislikes 0	
Response	
Jennie Wike - Tacoma Public Utilities (Tacoma, WA) - 1,3,4,5,6 - WECC, Group Name Tacoma Power	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Cain Braveheart - Bonneville Power Administration - 1,3,5,6 - WECC	
Answer	Yes
Document Name	
Comment	

Likes 0

Dislikes 0

Response

Shengen Chen - RLC Engineering - NA - Not Applicable - NPCC

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Adrian Andreoiu - BC Hydro and Power Authority - 1,3,5, Group Name BC Hydro

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Steven Rueckert - Western Electricity Coordinating Council - 10, Group Name WECC

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Thomas Foltz - AEP - 3,5,6**Answer** Yes**Document Name****Comment**

Likes 0

Dislikes 0

Response**Gail Elliott - International Transmission Company Holdings Corporation - NA - Not Applicable - MRO,RF****Answer****Document Name****Comment**

No response received from Subject Matter Experts

Likes 0

Dislikes 0

Response**Rachel Coyne - Texas Reliability Entity, Inc. - 10****Answer****Document Name****Comment**

Texas RE agrees with having a definition of Inverter-Based Resource (IBR) appreciates the drafting team's efforts to write a definition. Texas RE is concerned, however, with the phrases "primarily active power" and "collector system(s)" and recommends they be clarified.

In using the phrase "primary active power" in the definition, it may imply that supplying reactive power from these IBRs are less important or nonessential. Additionally, using the phrase "collector system(s)" should be clarified to read "portions of the collector system(s) per the BES definition". In the BES Reference Document, there is a discussion about the common point of interconnection and the document indicates not all the collector system(s) are part of the BES.

Texas RE recommends the IBR definition be revised to the following:

Inverter-Based Resource (IBR): Any source of electric power consisting of one or more Power Electronic Devices (PEDs), that operates as a single resource, *supplies active and reactive power simultaneously*, and connects to the Bulk Power System. An IBR plant/facility includes the Power Electronic Devices, and the equipment designed primarily for delivering the power to a common point of connection (e.g. step-up transformers, *portions of collector system(s) per the BES definition*, main power transformer(s), and power plant controller(s)).

Lastly, Texas RE cautions drafting teams on being consistent with the IBR term. There have been drafts that use the term “IBR unit” rather than IBR, which is not defined. Texas RE recommends being consistent in the use of the term IBR across all applicable standards.

Likes	0
Dislikes	0
Response	

3. Provide any additional comments for the SDT to consider, if desired.

Steven Rueckert - Western Electricity Coordinating Council - 10, Group Name WECC

Answer

Document Name

Comment

None.

Likes 0

Dislikes 0

Response

Andy Thomas - Duke Energy - 1,3,5,6 - SERC,RF

Answer

Document Name

Comment

Please consider expanding the term “primarily” for the IBR term listed under the Technical Rationale and Considerations section that reads: ...supplies “primarily” active power, and c the statement that it can also provide reactive power.

Reference: MOD-026-2 – Verification of Dynamic Models and Data for BES Connected Facilities, Draft 4 of MOD-026-2, September 2023, Page 1 of 1, New or Modified Term(s) Used Standards

Likes 0

Dislikes 0

Response

Kendra Buesgens - MRO - 1,2,3,4,5,6 - MRO, Group Name MRO NSRF

Answer

Document Name

Comment

The MRO NSRF thanks the SDT for their efforts in defining inverter-based resource and is the proper way to proceed. SDT needs to consider other defined terms for inclusion in this Power, Reactive Power, Bulk Electrical System, et cetera. Using undefined versions of the aforementioned defined terms will lead to misinterpretation.

Likes 0

Dislikes 0

Response

Kacie Fischer - Oncor Electric Delivery - 1 - Texas RE

Answer

Document Name

Comment

Oncor believes it may be helpful if the following examples were moved out of the “Rationale and Technical Consideration” section and into the “Terms” section:

- The device examples from bullet points 1 and 2.
- The BESS clarification from bullet point 5. BESS acts like a load when it is charging, and the PED definition states “[t]his term excludes any load.” The BESS statement helps of whether it is a PED in the charging state. It would also make more sense that BESS be in one category regardless of its operation modes.

Likes 0

Dislikes 0

Response

Srikanth Chennupati - Entergy - 1,3,5,7 - SERC

Answer

Document Name

Comment

Technical Rational and Considerations Section:

a) Recommend to include co-located hybrid IBR devices/facilities in the discussion to clarify whether the proposed PED and IBR definitions apply to such technologies.

Likes 0

Dislikes 0

Response

George E Brown - Pattern Operators LP - 5

Answer

Document Name

Comment

Pattern Energy would like to thank the Standards Drafting Team for their efforts to define inverter-based resource.

Inverter based resource (IBR) needs to be defined on its own and in a general manner, exclusive of either generation or transmission. This will allow the IBR term to capture all types

equipment. Then when it is necessary to have specific regulations/requirements for IBRs, the regulations/requirements could further narrow the scope to which particular types of IBR regulations/requirements are applicable to using the Bulk Electrical System definition.

- Proposed definition:

Inverter Based Resource (IBR): Refer generally to Bulk Power System (BPS) connected facilities that have a power electronic device that converts direct current (dc) electricity to alternating current (ac) electricity between the ac grid and the source of electricity and vice versa. IBRs include but are not limited to type 3 and 4 wind turbine generators, solar photovoltaic inverters, and battery energy storage resources, as well as high voltage direct current circuits and flexible alternating current transmission system devices like static synchronous compensators and static volt-ampere reactive compensators.

- Application of the IBR term in regulations/requirements examples, not all inclusive:
 - Aggregate Plant Level:

“IBRs identified through Inclusion I2 or I4 of the Bulk Electrical System definition at an aggregate plant/facility level, shall...”

- Individual Unit Level:

“Individual IBR generating units of dispersed power producing resources identified through Inclusion I4 of the Bulk Electrical System definition, shall...”

Referenced Documents:

2023_NERC_Guide_Inverter-Based-Resources.pdf

NERC_IBR_QuickReferenceGuideMarch2023.pdf

Likes 0

Dislikes 0

Response

Christine Kane - WEC Energy Group, Inc. - 3,4,5,6, Group Name WEC Energy Group

Answer

Document Name

Comment

WEC Energy Group supports the comments of the NAGF.

Likes 0

Dislikes 0

Response

Xiaoyu Wang - Enel Green Power - NA - Not Applicable - NA - Not Applicable

Answer

Document Name

Comment

Please the SDT consider providing further clarifications on the PED definition.

Generally speaking, the team is to use this term to include a broader range of power electronics technology than IBRs, mainly to cover the FACTS such as StatCom, SVC, etc. This is conveyed by the PED definition and its Technical Rationales.

However, in the IBR term definition, it reads that 'An IBR plant/facility includes the Power Electronic Devices, and the equipment designed primarily for delivering the power to a common bus (e.g. step-up transformers, collector system(s), main power transformer(s), and power plant controller(s)).' Sounds like here it refers PED to the inverter unit/device/equipment vs. other equipment/components within the IBR plant, such as transformers and collector systems.

It will be beneficial to clarify the actual scope of PED for future use.

Likes 0

Dislikes 0

Response

Shengen Chen - RLC Engineering - NA - Not Applicable - NPCC

Answer

Document Name

Comment

Maybe also consider some languages that describing the software come with PED and IBR could also control/impact the performance of PED and IBR.

Likes 0

Dislikes 0

Response

Israel Perez - Salt River Project - 1,3,5,6 - WECC

Answer

Document Name

Comment

SRP does not support the addition of these new terms to the standard. These new terms are specific to IBR's. SRP strongly feels Inverter Based Resources should have separate sta

Likes 0

Dislikes 0

Response

Nikki Carson-Marquis - Minnkota Power Cooperative Inc. - 1 - MRO

Answer

Document Name

Comment

Minnkota Power Cooperative appreciates the opportunity to comment.

Likes 0

Dislikes 0

Response

Mark Garza - FirstEnergy - FirstEnergy Corporation - 1,3,4,5,6, Group Name FE Voter

Answer

Document Name

Comment

N/A

Likes 0

Dislikes 0

Response

Adrian Raducea - DTE Energy - Detroit Edison Company - 3,5, Group Name DTE Energy - DTE Electric

Answer

Document Name

Comment

None

Likes 0

Dislikes 0

Response	
Chantal Mazza - Hydro-Quebec (HQ) - 1 - NPCC	
Answer	
Document Name	
Comment	
An IBR doesn't have to be connected to the Bulk Power System to be an IBR. This is the case for IBR on the distribution grid or on isolated grid.	
Within MOD-026 please keep distinction between LCC HVDC vs. VSC HVDC.	
We have concerns with the proposed IBR definition and the existing BES definition, in particular the I4 inclusion with refers to "Dispersed power producing resources" (DPPR) and is v proposed IBR definition. Our understanding is that an IBR is automatically considered a DDP, but the opposite is possibly not the case? Are there 2 distinct types of facilities, IBR (r (BES)? We encourage the SDT to ensure consistent use of these terms when referring to an installation	
Likes 0	
Dislikes 0	
Response	
Pamela Frazier - Southern Company - Southern Company Services, Inc. - 1,3,5,6 - MRO,WECC,Texas RE,SERC,RF, Group Name Southern Company	
Answer	
Document Name	
Comment	
Consider adding the following language to the proposed IBR definition: "An IBR plant/facility includes the Power Electronic Devices, and the equipment designed primarily for delivering common point of connection (e.g. step-up transformers, collector system(s), main power transformer(s), and power plant controller(s))."	
HVDC systems and transmission-connected FACTS devices (STATCOMs and SVCs, etc) are power electronic devices. Simply saying they are not in the IBR definition is not a valid disassociation from the definition. If those device types are not intended or planned to be part of the development of future reliability standards, then the exclusion from applicability s the standard, not in the development of a definition that doesn't satisfy common sense.	
Likes 0	
Dislikes 0	
Response	
Daniela Atanasovski - APS - Arizona Public Service Co. - 1,3,5,6	
Answer	

Document Name	
Comment	
None	
Likes 0	
Dislikes 0	
Response	
Wayne Sipperly - North American Generator Forum - 5 - MRO,WECC,Texas RE,NPCC,SERC,RF	
Answer	
Document Name	
Comment	
<i>Technical Rational and Considerations Section:</i>	
a) <i>Recommend to include co-located hybrid IBR devices/facilities in the discussion to clarify whether the proposed PED and IBR definitions apply to such technologies. Please see Guide for reference that NERC published back in 2021:</i>	
https://www.nerc.com/pa/comp/RegistrationReferenceDocsDL/CMEP%20Practice%20Guide%20%20Application%20of%20the%20BES%20Definition%20to%20BESS%20and%20H	
Likes 0	
Dislikes 0	
Response	
Anna Todd - Southern Indiana Gas and Electric Co. - 3,5,6 - RF	
Answer	
Document Name	
Comment	
N/A	
Likes 0	
Dislikes 0	
Response	
Junji Yamaguchi - Hydro-Quebec (HQ) - 1,5	

Answer

Document Name

Comment

An IBR doesn't have to be connected to the Bulk Power System to be an IBR. This is the case for IBR on the distribution grid or on isolated grid.
Within MOD-026 please keep distinction between LCC HVDC vs. VSC HVDC.
We have concerns with the proposed IBR definition and the existing BES definition, in particular the I4 inclusion with refers to "Dispersed power producing resources" (DPPR) and is v proposed IBR definition. Our understanding is that an IBR is automatically considered a DDPR, but the opposite is possibly not the case? Are there 2 distinct types of facilities, IBR (I (BES)? We encourage the SDT to ensure consistent use of these terms when referring to an installation.

Likes 0

Dislikes 0

Response

Kimberly Turco - Constellation - 5,6

Answer

Document Name

Comment

Constellation has no additional comments.

Kimberly Turco on behalf of Constellation Segments 5 and 6

Likes 0

Dislikes 0

Response

Hillary Creurer - Allete - Minnesota Power, Inc. - 1

Answer

Document Name

Comment

Minnesota Power supports MRO's NERC Standards Review Forum's (NSRF) comments.

Likes 0

Dislikes 0

Response

Alison MacKellar - Constellation - 5,6

Answer

Document Name

Comment

Constellation has no additional comments.

Alison Mackellar on behalf of Constellation Segments 5 and 6

Likes 0

Dislikes 0

Response

Jodirah Green - ACES Power Marketing - 1,3,4,5,6 - MRO,WECC,Texas RE,SERC,RF, Group Name ACES Collaborators

Answer

Document Name

Comment

Thank you for the opportunity to comment.

Likes 0

Dislikes 0

Response

Charles Yeung - Southwest Power Pool, Inc. (RTO) - 2 - MRO,WECC

Answer

Document Name

Comment

The headers for R4, R5, and R6 in the posted draft 3 of MOD-026-2 infer they are applicable to IBRs by stating “Inverter Based Resources.” However, these three requirements also does not meet the “IBR” definition, e.g. - FACTS, VSC HVDC, and LCC HVDC. The headers should be changed to remove “Inverter Based Resources” or removed in their entirety to

In addition the second bullet of the section “Technical Rationale and Considerations” states that the presence of the phrase “primarily supplies active power” in the IBR definition is the systems would not be considered IBRs. The SRC agrees that HVDC systems should not be considered IBRs, but believes the stated reason is not correct. The SDT’s desire for the IB

limited to generating resources or sources of electric power would be a more accurate basis for excluding HVDC systems from the universe of IBRs.

It is necessary for the standard to distinguish between unit level and plant level requirements for commissioning purposes, since most facilities perform commissioning tests as interim as building blocks leading up to the final end-to-end testing. This would help make available IBR test information prior to the commercial operation date. Finally, in the fourth bullet of the standard, it is unclear what requirements are being proposed at the device level. In particular, with respect to model verification and validation, it is unclear what need exists for device-level NERC requirements of plant-level requirements.

Likes 0

Dislikes 0

Response

Kennedy Meier - Electric Reliability Council of Texas, Inc. - 2

Answer

Document Name

Comment

ERCOT joins the comments submitted by the IRC SRC and adopts them as its own.

Additionally, the definitions and associated technical guidance should account for HVDC systems and their associated inverters, all of which may be considered PEDs. An HVDC system may consist of multiple smaller HVDC ties that include multiple inverters. Offshore wind farms may also employ a VSC HVDC transmission system to transfer power from the wind turbine PEDs to the main interconnection, potentially with different owners. Finally, ERCOT recommends that the SDT coordinate with the Project No. 2023-01 SDT, which has also been considering the application of the term IBR.

Likes 0

Dislikes 0

Response

Gail Elliott - International Transmission Company Holdings Corporation - NA - Not Applicable - MRO,RF

Answer

Document Name

Comment

No response received from Subject Matter Experts

Likes 0

Dislikes 0

Response

Shannon Mickens - Southwest Power Pool, Inc. (RTO) - 2 - MRO,WECC, Group Name SPP RTO

Answer

Document Name

Comment

N/A

Likes 0

Dislikes 0

Response

C. A. Campbell - LS Power Development, LLC - 5

Answer

Document Name

Comment

LS Power Development agrees with the comments submitted by the North American Generator Forum (NAGF).

Likes 0

Dislikes 0

Response