NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

Consideration of Comments

Project Name:	2020-06 Verifications of Models and Data for Generators | Draft 2 of IBR Definitions
Comment Period Start Date:	2/22/2024
Comment Period End Date:	4/8/2024
Associated Ballot(s):	2020-06 Verifications of Models and Data for Generators IBR Unit AB 2 DEF 2020-06 Verifications of Models and Data for Generators IBR-related Definitions | Implementation Plan AB 2 OT 2020-06 Verifications of Models and Data for Generators Inverter-Based Resource (IBR) AB 2 DEF

There were 49 sets of responses, including comments from approximately 144 different people from approximately 102 companies representing 10 of the Industry Segments as shown in the table on the following pages.

All comments submitted can be reviewed in their original format on the project page.

If you feel that your comment has been overlooked, let us know immediately. Our goal is to give every comment serious consideration in this process. If you feel there has been an error or omission, contact Manager of Standards Information, Nasheema Santos (via email) or at (404) 446-2564.

Questions

1. 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.

2. Do you support the definition for IBR Unit 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. As discussed in the Technical Rationale, the proposed definitions would define the scope of equipment, but would not define the scope of IBR units subject to mandatory compliance with Reliability Standards. Each standard would define the applicable units subject to compliance with that standard. An example to include both BES and non-BES IBRs is as follows:

Section 4. Applicability:

4.1 Functional Entities: Generator Owner, Generator Operator

4.1 Facilities: (1) BES Inverter-Based Resources; and (2) Non-BES Inverter Based Resources (IBRs) that that either have or contribute to an aggregate nameplate capacity of greater than or equal to 20 MVA, connected through a system designed primarily for delivering such capacity to a common point of connection at a voltage greater than or equal to 60 kV.

Provide any suggested revisions you feel would improve the readability of this example.

4. Provide any additional comments for the DT to consider, if desired.

The Industry Segments are:

1 — Transmission Owners
2 — RTOs, ISOs
3 — Load-serving Entities
4 — Transmission-dependent Utilities
5 — Electric Generators
6 — Electricity Brokers, Aggregators, and Marketers
7 — Large Electricity End Users
8 — Small Electricity End Users
9 — Federal, State, Provincial Regulatory or other Government Entities
10 — Regional Reliability Organizations, Regional Entities

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	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
MRO	Anna Martinson	1,2,3,4,5,6	MRO	MRO Group	Shonda McCain	Omaha Public Power District (OPPD)	1,3,5,6	MRO
					Michael Brytowski	Great River Energy	1,3,5,6	MRO
					Jamison Cawley	Nebraska Public Power District	1,3,5	MRO
					Jay Sethi	Manitoba Hydro (MH)	1,3,5,6	MRO
					Husam Al-Hadidi	Manitoba Hydro (System Preformance)	1,3,5,6	MRO
					Kimberly Bentley	Western Area Power Adminstration	1,6	MRO

Organization Name	Name	Segment(s)	Region	Group Name	Group Member Name	Group Member Organization	Group Member Segment(s)	Group Member Region
					Jaimin Patal	Saskatchewan Power Coporation (SPC)	1	MRO
					George Brown	Pattern Operators LP	5	MRO
					Larry Heckert	Alliant Energy (ALTE)	4	MRO
					Terry Harbour	MidAmerican Energy Company (MEC)	1,3	MRO
					Dane Rogers	Oklahoma Gas and Electric (OG&E)	1,3,5,6	MRO
					Seth Shoemaker	Muscatine Power & Water	1,3,5,6	MRO
					Michael Ayotte	ITC Holdings	1	MRO
					Andrew Coffelt	Board of Public Utilities-Kansas (BPU)	1,3,5,6	MRO
					Peter Brown	Invenergy	5,6	MRO

Organization Name	Name	Segment(s)	Region	Group Name	Group Member Name	Group Member Organization	Group Member Segment(s)	Group Member Region
					Angela Wheat	Southwestern Power Administration	1	MRO
					Bobbi Welch	Midcontinent ISO, Inc.	2	MRO
Southwest Power Pool, Inc. (RTO)	Charles Yeung	2	MRO,SPP RE,WECC	SRC 2023	Charles Yeung	SPP	2	MRO
					Ali Miremadi	CAISO	1	WECC
					Helen Lainis	IESO	1	NPCC
					Bobbi Welch	Midcontinent ISO, Inc.	2	MRO
					Greg Campoli	NYISO	1	NPCC
					Elizabeth Davis	PJM	2	RF
					Kennedy Meier	Electric Reliability Council of Texas, Inc.	2	Texas RE
WEC Energy Group, Inc.	Christine Kane	3		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

Organization Name	Name	Segment(s)	Region	Group Name	Group Member Name	Group Member Organization	Group Member Segment(s)	Group Member Region
Southern Company - Southern Company Services, Inc.	Colby Galloway	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
					Ron Carlsen	Southern Company - Southern Company Generation	6	SERC
					Leslie Burke	Southern Company - Southern Company Generation	5	SERC
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.	2	WECC

Organization Name	Name	Segment(s)	Region	Group Name	Group Member Name	Group Member Organization	Group Member Segment(s)	Group Member Region
					Bill Pezalla	Old Dominion Electric Cooperative	3,4	SERC
					Jason Procuniar	Buckeye Power, Inc.	4	RF
					Jolly Hayden	East Texas Electric Cooperative, Inc.	NA - Not Applicable	Texas RE
					Nick Fogleman	Prairie Power, Inc.	1,3	SERC
					Kylee Kropp	Sunflower Electric Power Corporation	1	MRO
FirstEnergy - FirstEnergy Corporation	Mark Garza	4		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

Organization Name	Name	Segment(s)	Region	Group Name	Group Member Name	Group Member Organization	Group Member Segment(s)	Group Member Region
					Stacey Sheehan	FirstEnergy - FirstEnergy Corporation	6	RF
Michael Johnson	Michael Johnson		WECC	PG&E All Segments	Marco Rios	Pacific Gas and Electric Company	1	WECC
					Sandra Ellis	Pacific Gas and Electric Company	3	WECC
					Tyler Brun	Pacific Gas and Electric Company	5	WECC
Black Hills Corporation	Rachel Schuldt	6		Black Hills Corporation - All Segments	Micah Runner	Black Hills Corporation	1	WECC
					Josh Combs	Black Hills Corporation	3	WECC
					Rachel Schuldt	Black Hills Corporation	6	WECC
					Carly Miller	Black Hills Corporation	5	WECC
					Sheila Suurmeier	Black Hills Corporation	5	WECC
Northeast Power Coordinating Council	Ruida Shu	1,2,3,4,5,6,7,8,9,10	NPCC	NPCC RSC	Gerry Dunbar	Northeast Power Coordinating Council	10	NPCC

Organization Name	Name	Segment(s)	Region	Group Name	Group Member Name	Group Member Organization	Group Member Segment(s)	Group Member Region
					Alain Mukama	Hydro One Networks, Inc.	1	NPCC
					Deidre Altobell	Con Edison	1	NPCC
					Jeffrey Streifling	NB Power Corporation	1	NPCC
					Michele Tondalo	United Illuminating Co.	1	NPCC
					Stephanie Ullah-Mazzuca	Orange and Rockland	1	NPCC
					Michael Ridolfino	Central Hudson Gas & Electric Corp.	1	NPCC
					Randy Buswell	Vermont Electric Power Company	1	NPCC
					James Grant	NYISO	2	NPCC
					John Pearson	ISO New England, Inc.	2	NPCC
					Harishkumar Subramani Vijay Kumar	Independent Electricity System Operator	2	NPCC
					Randy MacDonald	New Brunswick	2	NPCC

Organization Name	Name	Segment(s)	Region	Group Name	Group Member Name	Group Member Organization	Group Member Segment(s)	Group Member Region
						Power Corporation		
					Dermot Smyth	Con Ed - Consolidated Edison Co. of New York	1	NPCC
					David Burke	Orange and Rockland	3	NPCC
					Peter Yost	Con Ed - Consolidated Edison Co. of New York	3	NPCC
					Salvatore Spagnolo	New York Power Authority	1	NPCC
					Sean Bodkin	Dominion - Dominion Resources, Inc.	6	NPCC
					David Kwan	Ontario Power Generation	4	NPCC
					Silvia Mitchell	NextEra Energy - Florida Power and Light Co.	1	NPCC
					Glen Smith	Entergy Services	4	NPCC

Organization Name	Name	Segment(s)	Region	Group Name	Group Member Name	Group Member Organization	Group Member Segment(s)	Group Member Region
					Sean Cavote	PSEG	4	NPCC
					Jason Chandler	Con Edison	5	NPCC
					Tracy MacNicoll	Utility Services	5	NPCC
					Shivaz Chopra	New York Power Authority	6	NPCC
					Vijay Puran	New York State Department of Public Service	6	NPCC
					ALAN ADAMSON	New York State Reliability Council	10	NPCC
					David Kiguel	Independent	7	NPCC
					Joel Charlebois	AESI	7	NPCC
					Joshua London	Eversource Energy	1	NPCC
Elevate Energy Consulting	Ryan Quint	NA - Not Applicable	NA - Not Applicable	Elevate Energy Consulting	Ryan Quint	Elevate Energy Consulting		NA - Not Applicable
					N/A	N/A		NA - Not Applicable

Organization Name	Name	Segment(s)	Region	Group Name	Group Member Name	Group Member Organization	Group Member Segment(s)	Group Member Region
Dominion - Dominion Resources, Inc.	Sean Bodkin	6		Dominion	Connie Lowe	Dominion - Dominion Resources, Inc.	3	NA - Not Applicable
					Lou Oberski	Dominion - Dominion Resources, Inc.	5	NA - Not Applicable
					Larry Nash	Dominion - Dominion Virginia Power	1	NA - Not Applicable
					Rachel Snead	Dominion - Dominion Resources, Inc.	5	NA - Not Applicable
Western Electricity Coordinating Council	Steven Rueckert	10		WECC Entity Monitoring	Steve Rueckert	WECC	10	WECC
					Phil O'Donnell	WECC	10	WECC
Tim Kelley	Tim Kelley		WECC	SMUD and BANC	Nicole Looney	Sacramento Municipal Utility District	3	WECC
					Charles Norton	Sacramento Municipal Utility District	6	WECC

Organization Name	Name	Segment(s)	Region	Group Name	Group Member Name	Group Member Organization	Group Member Segment(s)	Group Member Region
					Wei Shao	Sacramento Municipal Utility District	1	WECC
					Foung Mua	Sacramento Municipal Utility District	4	WECC
					Nicole Goi	Sacramento Municipal Utility District	5	WECC
					Kevin Smith	Balancing Authority of Northern California	1	WECC

1. *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*.

Duane Franke - Manitoba Hydro - 1,3,5,6 - MRO	
Answer	No
Document Name	
Comment	
- The off-shore IBR connected via VSC-HVDC should be included in the IBR definition list of examples. *- We have concerns about the term 'not limited to' in the definition, which may create some confusion about what could be considered as IBR, such as a STATCOM with limited active power capability to support the system inertia or system reliability, that should not belong to the IBR, even it meets the IBR definition. We proposed adding the exclusion terms in the definition, which may state that an inverter-based plant with limited active power capability is not part of the IBR definition.* *- Any FACT device connected to the IBR plant to support the IBR operation should be included in the IBR auxiliary equipment and be part of the IBR definition.*	
Likes 0	
Dislikes 0	
Response	
Thank you for the comment, this comment will be passed along to the drafting team (DT) for consideration when drafting the next draft of the IBR definition. The DT will consider not carrying the IBR Unit term for the next ballot.	
Sean Bodkin - Dominion - Dominion Resources, Inc. - 6, Group Name Dominion	
Answer	No
Document Name	
Comment	

Dominion Energy does not agree with the proposed definition and offers the following alternative: **Inverter Based Resources (IBR):** IBRs include all NERC registered generating facilities directly connected to the Bulk Power System at 60kV and above using power electronic devices that change direct current (DC) power produced by a resource to alternating current (AC).	
Likes 0	
Dislikes 0	
Response	
It is the DT's intent that IBR can apply to any voltage class and are not inherently linked to NERC registration. Newly proposed NERC registration types specifically call those out as non-registered IBRs.	
Kristina Marriott - Miller Bros. Solar, LLC - 5 - MRO,WECC,Texas RE	
Answer	No
Document Name	
Comment	
MBS supports the direction the SDT has taken. However, we believe that the sentence providing examples should be deleted. This sentence is not necessary, and may cause ambiguity on what other technologies may or may not qualify. MBS would support the definition if the examples were left out.	
Likes 0	
Dislikes 0	
Response	
Thank you for the comment, the DT has addressed the listed examples from FERC Order No.901, in which examples have proven to pose risks to the transmission system reliability as documented by ERO disturbance reports. It was not the DT intent to exclude any types of inverter-based resources.	
Rachel Schuldt - Black Hills Corporation - 6, Group Name Black Hills Corporation - All Segments	
Answer	No

Document Name	
Comment	
Black Hills Corporation believes that only the Inverter-Based Resource (IBR) definition is needed. Consider revision of the definition as follows: *"Generating unit that consists of an individual device or a grouping of multiple devices that:* • *use a power electronic interface, such as an inverter or converter,* • *can export Real Power from a primary energy source or energy storage system,* • *and are connected through a system designed primarily for delivering Real Power to a common point of interconnection to Transmission."*	
Likes 0	
Dislikes 0	
Response	
Thank you for the comment, the DT has re-considered the use of IBR Unit and is no longer proposing it as a definition in the new ballot.	
Jennifer Bray - Arizona Electric Power Cooperative, Inc. - 1	
Answer	No
Document Name	
Comment	
AEPC has signed on to ACES comments: We at ACES applaud the SDT for the work that has been put into developing these definitions. We are greatly encouraged by the SDT's willingness to heed industry feedback and implement changes to the IBR definition. It is the opinion of ACES that the currently proposed IBR definition, while overall very good, would benefit from a few minor changes. It is our opinion that the addition of the phrase "plant/facility" within the definition potentially introduces more confusion than it eliminates. As this term is not explicitly defined, it allows for a considerable amount of interpretation by the industry. It is our opinion that	

the term facility
should instead be included within the defined term itself (i.e., Inverter-Based Resource Facility) in order to be more consistent with other uses of this phrase within the NERC Glossary of Terms.

Lastly, we believe that the last sentence of the definition wherein a list of example technologies is provided should be struck. It is our perspective that this list is superfluous and unnecessary. While we appreciate the intent of the SDT in providing said list, we believe this level of granularity is best provided via the Reliability Standards themselves as stated in Section 2 of the Technical Rationale (e.g., "…the Applicability Section for that Reliability Standard(s) will specify which IBRs are applicable."). If it is the intention of the SDT to specifically exclude certain resource types, then we suggest either providing an explicit list of excluded resource types or modifying the definition in such a manner so as to not include these resource types in the first place. Thus, it is our recommendation that the IBR definition be renamed to IBR Facility and modified as follows:

- **Inverter-Based Resource (IBR) Facility**: One or more IBR Unit(s), and any associated Element(s) required for the operation thereof, connected to the electric system and operated as a single resource at a common point of interconnection.

Likes 0	
Dislikes 0	

Response

Thank you for the comment, the DT has considered the use plant/facility but maintains that an IBR is meant to be synonymous with the topology of a plant and facility. The DT has addressed the listed examples from FERC Order no.901 and which examples have proven to pose risks to the transmission system reliability as documented by ERO disturbance reports. It was not the DT intent to exclude any types of inverter-based resources.

Israel Perez - Israel Perez On Behalf of: Mathew Weber, Salt River Project, 3, 1, 6, 5; Sarah Blankenship, Salt River Project, 3, 1, 6, 5; Thomas Johnson, Salt River Project, 3, 1, 6, 5; Timothy Singh, Salt River Project, 3, 1, 6, 5; - Israel Perez

Answer	No
Document Name	

Comment

SRP does not support the addition or modification 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	
The original SAR of the Project 2020-06 requires the explicit consideration of IBR in MOD-026 and MOD-027. In addition, as of the current effective version of MOD-026 and MOD-027 these currently apply to IBR.	
Srikanth Chennupati - Entergy - Entergy Services, Inc. - 1,3,5,6 - SERC	
Answer	No
Document Name	
Comment	
• Entergy believes that this Inverter-Based Resource (IBR) definition and IBR Unit definition should be combined into to a single definition. • Proposed definition is "A facility that is connected to the electric system, consisting of one or more devices using a power electronic interface (such as an inverter or converter) and capable of exporting Real Power and acting as a single resource at a common point of interconnection. IBRs include but are not limited to, solar photovoltaic (PV), Type 3 and Type 4 wind, battery energy storage system (BESS), and fuel cell."	
Likes 0	
Dislikes 0	
Response	
Thank you for the comment, the DT has re-considered the use of IBR Unit and is no longer proposing it as a definition in the new ballot.	
Anna Martinson - MRO - 1,2,3,4,5,6 - MRO, Group Name MRO Group	
Answer	No
Document Name	
Comment	
Defining Inverter-Based Resource (IBR) at an aggregate level and at individual level, having two definitions, is unnecessary and inconsistent with existing defined terms. An IBR is a piece of electrical equipment and therefore the definition should stay consistent with defining it as a piece of electrical equipment. Resource is not a defined term and can be used to define either an individual unit or	

aggregate set of units, please see Blackstart Resource definition. Further, defined terms already exist, such as Facility, that can be utilized to clearly articulate that IBR term is intended to be used at an aggregate level in certain contexts. Additionally, undefined terms such as facility or plant can be used, as currently done in existing standards, when a defined term is not adequate. For example, IBR generating Facility or facility would refer to the aggregate level, whereas IBR individual generating unit would refer to a single wind turbine generator or photovoltaic inverter.

The MRO NSRF proposes the following:

Inverter-Based Resource (IBR):

A generating unit(s) that consists of an individual device(s) that uses a power electronic interface, such as an inverter or converter, capable of exporting Real Power from a primary energy source or energy storage system, and that are connected through a system designed primarily for delivering Real Power to a common point of interconnection to Transmission.

Likes 1	Lincoln Electric System, 5, Millard Brittany
Dislikes 0	

Response

Thank you for the comment, this comment will be passed along to the DT for consideration for the next draft of the IBR definition. The team will consider no IBR Unit term for the next ballot.

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

Answer	No
Document Name	

Comment

Duke Energy proposes the following three (3) IBR building-block related definitions. Dividing the NERC definitions into 3 definitions, helps align the terms with current NERC usage of the terms for non-IBR generators and with other industry IBR standards. Unit is normally understood as a combination of related equipment which together functions as a single entity for the industry and GADS reported data. This proposed matching of terms will also reduce confusion within other standards. Additionally, the modeling standard should recognize that modeling may need to be split by inverter model and/or resource type but recombined as a unit based on how the devices are

controlled (e.g., PV and BESS inverters need different models, but may be operated together to regulate voltage). The fact that the devices must be modeled differently does not mean that each type of inverter must be defined as a unit.

Definition #1

Inverter-Based Resource Plant/Facility (IBR Plant/Facility): A plant/facility connected to the electric system that consist of one or more IBR Unit(s) at a common point of interconnection. IBRs types include, but are not limited to, solar photovoltaic (PV), Type 3 and Type 4 wind, battery energy storage system (BESS), and fuel cell.

Justification: With regard to the removal of "Operated as a single resource", this phrase implied that each unit must be combined to operate as a single resource. Generally, multiple units at a plant are controlled individually.

Definition #2

Inverter-Based Resource Unit (IBR Unit): A single or group of devices that are operated and controlled together as a single resource (entity). The unit utilizes a power electronic interface, such as inverters or converters, capable of exporting Power from a primary energy source or energy storage system.

Justification: The phrase "Single point on the collector system" was removed because that the implied condition could result in multiple interpretations. The SDT was possibly assuming that the IEEE Point of Connection term is equivalent to the phrase "single point on the collector system" but are not equivalent in several cases.

Definition: Unit - An electricity generator and related equipment essential to the electricity generator's operation, which together function as a single entity. (Source: Generating Unit Definition: 414 Samples | Law Insider)

Definition #3

Inverter-Based Resource Device (IBR Device): An individual device, such as an inverter or converter, capable of exporting Power from a primary energy source or energy storage system.

Justification: This additional term was added because the NERC use of the term Unit does not align well with IEEE IBR Unit. The IEEE definition of an IBR unit is directed towards a component, or device. It can be a single inverter, a central inverter unit, or a group of inverters tested by a NRTL to function together. The NERC definition of a Unit appears more focused on a collection of individual devices designed and constructed to function together, but not designed as a single package.

Likes 0	
Dislikes 0	
Response	
Thank you for the comment, this comment will be passed along to the DT for consideration for the next draft of a singular IBR definition. The team decided to re ballot IBR as a single definition instead multiple.	
Christine Kane - WEC Energy Group, Inc. - 3, Group Name WEC Energy Group	
Answer	No
Document Name	
Comment	
WEC Energy Group supports the comments of the MRO NSRF.	
Likes 0	
Dislikes 0	
Response	
Thank you for the comment, please see the response MRO NSRF.	
Dennis Chastain - Tennessee Valley Authority - 1,3,5,6 - SERC	
Answer	No
Document Name	
Comment	
The Draft 2 "IBR" definition states that it's a plant/facility consisting of one or more IBR Unit(s). The definition of "consisting" is "composed or made up of". As such, the definition is basically stating that an IBR is made up of IBR Unit(s). This is not correct as the updated definition of an IBR Unit is that it's a "device" and not a "plant/facility". As such, suggest changing the words "consisting of" to "using" such that the definition would then read:	

"A plant/facility that is connected to the electric system **using** one or more IBR Unit(s) operated as a single resource at a common point of interconnection. IBRs include, but are not limited to, solar photovoltaic (PV), Type 3 and Type 4 wind, battery energy storage system (BESS), and fuel cell."	
Likes 0	
Dislikes 0	
Response	
Thank you for the comment, the DT has decided to remove IBR Unit and only ballot the term IBR. The team has updated IBR to not include IBR Unit within the new definition.	
Donna Wood - Tri-State G and T Association, Inc. - 1	
Answer	No
Document Name	
Comment	
Tri-State Generation and Transmission supports the comments of the MRO NSRF.	
Likes 0	
Dislikes 0	
Response	
Thank you for the comment, please see the response to MRO NSRF's comment.	
Carver Powers - Utility Services, Inc. - 4	
Answer	No
Document Name	
Comment	
The proposed definition first states that an IBR is a plant/facility but the last sentence state that an "IBR includes" and then lists a type of technology (solar photovoltaic) and elements that include inverters to convert power from DC to AC (Type 3 and Type 4) and elements	

that require separate devices (battery energy storage system, fuel cell). With the proposed definition, it is unclear whether an IBR is an Element or a plant/facility.

Suggest moving the concepts detailed in the second sentence to the IBR Unit definition for clarity of the undefined term “power source” used in that definition.

Both “plant” and “facility” are not defined. The term facility is often confused with the NERC defined term “Facility”. CIP-002 R1 uses the undefined term “asset” and then lists the applicable assets. Suggest replacing the term “facility” with “asset”.

The term “electric system” is undefined. It seems that the intent is to allow the IBR definition to apply to more than the BES or BPS but any two electrical devices connected together could be an “electric system”. Suggest referencing that the IBR is used to convert power that is exported from the plant/facility.

Recommend clarifying “Type 3 and Type 4 wind” by including “turbine” after wind in the proposed IBR definition.

“Solar photovoltaic” is a type of technology or method to generate electricity and not a device. A plant may have ancillary devices such as lights and cameras, that use solar photovoltaic cells to charge their batteries. These ancillary devices should not be IBRs.

The NERC glossary does not define acronyms within definition for a different term. Both PV and BESS acronyms should not be included in the definition of IBR.

Suggest the following:

“Inverter-Based Resource (IBR): A plant/asset that uses one or more IBR Unit(s) for the conversion of power for export from the plant/asset and operated as a single resource at a common point of interconnection.”

Likes 0	
Dislikes 0	

Response

The IBR definition states that the IBR is a plant/facility comprised of those individual technology types. This is as opposed to a synchronous resource that is comprised of synchronous generators.

IBR Unit Definition has been removed and will not be balloted this next balloting period.

It was the DT's intent to use lowercase plant/facility in order to keep it separate from the NERC defined term Facility. It was the DT's intent that IBR can refer to any voltage class system, as long as it is a plant/facility that is made up of one or more individual devices that export power to an AC electric system using power electronic devices. The DT agrees with this final point.	
Megan Melham - Decatur Energy Center LLC - 5	
Answer	No
Document Name	
Comment	
Capital Power supports the NAGF comments for the IBR definition as below: The NAGF believes that only the Inverter-Based Resource (IBR) definition is needed and should be revised as follows: "A generating unit(s) that consists of one or more individual device(s) that uses a power electronic interface, such as an inverter or converter, capable of exporting Real Power from a primary energy source or energy storage system, and that are connected through a system designed primarily for delivering Real Power to a common point of interconnection to Transmission."	
Likes 0	
Dislikes 0	
Response	
Thank you for the comment, the DT has re-considered the use of IBR Unit and is no longer proposing it as a definition in the new ballot.	
Dwanique Spiller - Berkshire Hathaway - NV Energy - 5	
Answer	No
Document Name	
Comment	
Defining Inverter-Based Resource (IBR) at an aggregate level and at individual level, having two definitions, is unnecessary and inconsistent with existing defined terms. An IBR is a piece of electrical equipment and therefore the definition should stay consistent with	

defining it as a piece of electrical equipment. Resource is not a defined term and can be used to define either an individual unit or aggregate set of units, please see Blackstart Resource definition. Further, defined terms already exist, such as Facility, that can be utilized to clearly articulate that IBR term is intended to be used at an aggregate level in certain contexts. Additionally, undefined terms such as facility or plant can be used, as currently done in existing standards, when a defined term is not adequate. For example, IBR generating Facility or facility would refer to the aggregate level, whereas IBR individual generating unit would refer to a single wind turbine generator or photovoltaic inverter.

NV Energy proposes the following:

Inverter-Based Resource (IBR):

A generating unit(s) that consists of an individual device(s) that uses a power electronic interface, such as an inverter or converter, capable of exporting Real Power from a primary energy source or energy storage system, and that are connected through a system designed primarily for delivering Real Power to a common point of interconnection to Transmission.

Likes 0	
Dislikes 0	

Response

Thank you for the comment, this will be passed along to the DT for consideration in the next draft of the terms. The DT also will not be moving forward with the IBR Unit term in the next ballot.

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

Answer	No
Document Name	

Comment

The NAGF believes that only the Inverter-Based Resource (IBR) definition is needed and should be revised as follows:

"A generating unit(s) that consists of one or more individual device(s) that uses a power electronic interface, such as an inverter or converter, capable of exporting Real Power from a primary energy source or energy storage system, and that are connected through a system designed primarily for delivering Real Power to a common point of interconnection to Transmission."

Likes 0	
Dislikes 0	
Response	
Thank you for the comment, the DT has re-considered the use of IBR Unit and is no longer proposing it as a definition in the new ballot.	
Lauren Giordano - Lauren Giordano On Behalf of: Dennis Sismaet, Northern California Power Agency, 4, 6, 3, 5; Jeremy Lawson, Northern California Power Agency, 4, 6, 3, 5; Marty Hostler, Northern California Power Agency, 4, 6, 3, 5; - Lauren Giordano	
Answer	No
Document Name	
Comment	
We believe the SDT needs to explain or clarify what "the electric system" is and how an IBR relates to the Bulk Electric System.	
Likes 0	
Dislikes 0	
Response	
IBR does not specifically relate to the BPS or BES as defined by NERC. IBRs can be located on any voltage class system.	
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 at ACES applaud the SDT for the work that has been put into developing these definitions. We are greatly encouraged by the SDT's willingness to heed industry feedback and implement changes to the IBR definition. It is the opinion of ACES that the currently proposed IBR definition, while overall very good, would benefit from a few minor changes. It is our opinion that the addition of the phrase "plant/facility" within the definition potentially introduces more confusion than it eliminates. As this term is not explicitly defined, it allows for a considerable amount of interpretation by the industry. It is our opinion that	

the term facility should instead be included within the defined term itself (i.e., Inverter-Based Resource Facility) in order to be more consistent with other uses of this phrase within the NERC Glossary of Terms.

Lastly, we believe that the last sentence of the definition wherein a list of example technologies is provided should be struck. It is our perspective that this list is superfluous and unnecessary. While we appreciate the intent of the SDT in providing said list, we believe this level of granularity is best provided via the Reliability Standards themselves as stated in Section 2 of the Technical Rationale (e.g., "…the Applicability Section for that Reliability Standard(s) will specify which IBRs are applicable."). If it is the intention of the SDT to specifically exclude certain resource types, then we suggest either providing an explicit list of excluded resource types or modifying the definition in such a manner so as to not include these resource types in the first place.

Thus, it is our recommendation that the IBR definition be renamed to IBR Facility and modified as follows:

Inverter-Based Resource (IBR) Facility: One or more IBR Unit(s), and any associated Element(s) required for the operation thereof, connected to the electric system and operated as a single resource at a common point of interconnection.

Likes 0	
Dislikes 0	

Response

Thank you for the comment, the DT has considered the use plant/facility but maintains that an IBR is meant to be synonymous with the topology of a plant and facility.
The DT has addressed the listed examples from FERC Order no.901 and which examples have proven to pose risks to the transmission system reliability as documented by ERO disturbance reports.
It was not the DT intent to exclude any types of inverter-based resources.

Joshua Phillips - Southwest Power Pool, Inc. (RTO) - 2

Answer	No
Document Name	

Comment

SPP requests the drafting team consider that some large loads may also use power electronic interfaces which may also encounter Sub Synchronous Resonance issues. SPP encourages the drafting team to consider if such loads should be considered in the IBR definitions

due to these similarities. While they do not inject real power into the grid, they do pull real power from the grid and the impacts of these types of loads tripping off can have impacts to reliability. Large loads can be considered resources when utilized as demand response, though requirements may need to be considered beyond a resource definition. To the extent these would not be covered by the definition proposed, we request consideration of including such clarifications in the definition.	
Likes 0	
Dislikes 0	
Response	
The DT did consider large power electronic loads, however decided to remain in line with industry consensus in that IBR are limited to those resources able to inject power into the EPS, as evidenced by NERC IRPS and IEEE 2800. If SPP has this concern the DT would recommend the commenter to look into submitting a SAR on this concern.	
Ryan Quint - Elevate Energy Consulting - NA - Not Applicable - NA - Not Applicable, Group Name Elevate Energy Consulting	
Answer	Yes
Document Name	
Comment	
We support the definition; however, the term "plant/facility" is a bit vague and unclear which could add confusion for entitites trying to be in compliance when using this term.	
Likes 0	
Dislikes 0	
Response	
Thank you for the comment, please refer to ACES comment response.	
Teresa Krabe - Lower Colorado River Authority - 5	
Answer	Yes
Document Name	

Comment	
LCRA supports the proposed IBR definition with the current Glossary of Terms. However, depending on how “point of interconnection” is defined, or if it is added to the Glossary of Terms, the IBR definition could become invalid since there may be multiple generation facilities behind a common GSU or Transmission Owner equipment which are operated independently and not “as a single resource.”	
Likes 0	
Dislikes 0	
Response	
Thank you for the comment.	
Matt Lewis - Lower Colorado River Authority - 1,5	
Answer	Yes
Document Name	
Comment	
LCRA TSC supports the proposed IBR definition with the current Glossary of Terms. However, depending on how “point of interconnection” is defined, or if it is added to the Glossary of Terms, the IBR definition could become invalid since there may be multiple generation facilities behind a common GSU or Transmission Owner equipment which are operated independently and not “as a single resource.”	
Likes 0	
Dislikes 0	
Response	
Thank you for the comment.	
Adrian Andreoiu - BC Hydro and Power Authority - 1, Group Name BC Hydro	
Answer	Yes
Document Name	

Comment
BC Hydro appreciates the drafting team's efforts and the opportunity to comment. Given the comprehensive treatment in the Technical Rationale, the second sentence in the proposed IBR definition is not required. BC Hydro suggests that the IBR definition can be simplified as follows: **IBR** – a plant including an individual IBR Unit or multiple IBR Units operated as a single resource connected to the electric system at a common point of connection. As well, BC Hydro sees a potential conflict between IBR as defined here and the recent updates to the NERC Rules of Procedure to the Generator Owner and Operator definitions. In the current draft of the NERC Rules of Procedure – Appendix 2 Definitions used in the Rules of Procedure and Appendix 5B Statement of Compliance Registry Criteria (Revision 8), the Category 2 Generator Owner entity is defined as "owns and maintains non-BES inverter based **generating resources** (emphasis added) that either have or contribute to an aggregate nameplate capacity of greater than or equal to 20 MVA, connected through a system designed primarily for delivering such capacity to a common point of connection at a voltage greater than or equal to 60 kV (Category 2 GO)". BC Hydro appreciates the discussion at item #3 in the Technical Rationale. However, depending on the interpretation of "generating resources", owners of certain IBR types such as battery energy storage systems (BESS) may not be registered as a GO for these facilities. This would create a potential discrepancy between definitions which may create a gap in the intended scope of applicability for MOD-026-2 and potentially other reliability standards, i.e., entities that would be included under the applicability section of the standard wouldn't be part of the MRS Program as they may not be registered if they don't meet the GO definition.

Likes 0	
Dislikes 0	

Response
Thank you for the comment, these comments will be passed along to the DT for consideration.
Michael Johnson - Michael Johnson On Behalf of: Marco Rios, Pacific Gas and Electric Company, 3, 1, 5; Sandra Ellis, Pacific Gas and Electric Company, 3, 1, 5; Tyler Brun, Pacific Gas and Electric Company, 3, 1, 5; - Michael Johnson, Group Name PG&E All Segments

Answer	Yes

Document Name	
Comment	
PG&E supports the IBR definition.	
Likes 0	
Dislikes 0	
Response	
Thank you for the support.	
Daniela Atanasovski - APS - Arizona Public Service Co. - 1	
Answer	Yes
Document Name	
Comment	
None	
Likes 0	
Dislikes 0	
Response	
Thank you for the comment.	
Gail Elliott - Gail Elliott On Behalf of: Michael Moltane, International Transmission Company Holdings Corporation, 1; - Gail Elliott	
Answer	Yes
Document Name	
Comment	

A White Paper authored by either the drafting team or NERC staff identifying those devices considered within the scope of the definition and those outside of the Inverter-Based Resource (IBR) definition would be helpful going forward, if maintained by NERC staff.	
Likes 0	
Dislikes 0	
Response	
Thank you for the comment, this idea will be passed along to DT for further consideration.	
Mark Garza - FirstEnergy - FirstEnergy Corporation - 4, Group Name FE Voter	
Answer	Yes
Document Name	
Comment	
None.	
Likes 0	
Dislikes 0	
Response	
Thank you for the support.	
Steven Rueckert - Western Electricity Coordinating Council - 10, Group Name WECC Entity Monitoring	
Answer	Yes
Document Name	
Comment	
WECC supports the definition and voted affirmative. However, we do have some questions that the SDT can hopefully address. How broad does the SDT consider the “common point of interconnection”? Is it one lead line to one station? Multiple lead lines to multiple transformers within a station? The industry responds to regulatory oversight (e.g., such as building plants at 74 MVA) and could respond to this definition in a similar manner by building a second point of interconnection. The risk would still be there but may remain	

unregulated. Provided technical rational supports avoiding confusion when applying Requirement language but may need to be enhanced to meet the reliability concerns of two (or more) points of interconnection. WECC agrees with bullet 7 in the Technical Rationale and each SDT using the defined terms needs to ensure clarity. Does the definition fully support all variants of hybrid plants? Care needs to be taken as more hybrid plants are being integrated. If the term "IBR" is used for a MOD Standard and represents a hybrid plant, how does a single model of the "IBR" represent the response? Granted, each part of the hybrid plant would be separate IBR Units which may dictate how Standards utilize the terms.	
Likes 0	
Dislikes 0	
Response	
1. It can be either one lead or multiple leads that all connect to the same POI. There can also be multiple POI's. The main idea is that they are all being controlled together to run as a single resource. 2. Yes, the definition does consider hybrid resources and is discussed in the TR. 3. In that case there would need to be multiple models that work together to model the response of the plant.	
Mark Gray - Edison Electric Institute - NA - Not Applicable - NA - Not Applicable	
Answer	Yes
Document Name	
Comment	
EEI has no objections to the IBR definition as proposed.	
Likes 0	
Dislikes 0	
Response	
Thank you for the support.	
Amy Wilke - American Transmission Company, LLC - 1	

Answer	Yes
Document Name	
Comment	
The language itself may be acceptable, but changes should be made to the technical rationale to explain where an IBR ends. If POI or where the facility is "connected to the electric power system" is the preferred term, this must be reconciled with other standards where IBR is intended to be used. Other standards are contemplating using the POM or high side of the main power transformer as the location where IBR performance is measured. NERC Proposed Definition - Inverter-Based Resource (IBR): A plant/facility that is connected to the electric system consisting of one or more IBR Unit(s) operated as a single resource at a common point of interconnection. IBRs include, but are not limited to, solar photovoltaic (PV), Type 3 and Type 4 wind, battery energy storage system (BESS), and fuel cell.	
Likes 0	
Dislikes 0	
Response	
Thank you for the comment, this comment will be passed along to the DT for consideration for the next draft of the IBR definition	
Thomas Foltz - AEP - 5	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Thank you for the support.	
Pirouz Honarmand - Pirouz Honarmand On Behalf of: Helen Lainis, Independent Electricity System Operator, 2; - Pirouz Honarmand	

Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Thank you for the support.	
Mohamad Elhusseini - DTE Energy - Detroit Edison Company - 3,5	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Thank you for the support.	
Casey Perry - PNM Resources - 1,3 - WECC,Texas RE	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	

Response	
Thank you for the support.	
Cain Braveheart - Bonneville Power Administration - 1,3,5,6 - WECC	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Thank you for the support.	
Dave Krueger - SERC Reliability Corporation - 10	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Thank you for the support.	
David Jendras Sr - Ameren - Ameren Services - 3	
Answer	Yes
Document Name	
Comment	

Likes 0	
Dislikes 0	
Response	
Thank you for the support.	
Chantal Mazza - Chantal Mazza On Behalf of: Nicolas Turcotte, Hydro-Quebec (HQ), 1, 5; - Chantal Mazza	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Thank you for the support.	
Junji Yamaguchi - Hydro-Quebec (HQ) - 5	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
The DT thanks you for your support.	
Colby Galloway - Southern Company - Southern Company Services, Inc. - 1,3,5,6 - SERC, Group Name Southern Company	

Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
The Drafting Team thanks you for your support.	
Ruida Shu - Northeast Power Coordinating Council - 1,2,3,4,5,6,7,8,9,10 - NPCC, Group Name NPCC RSC	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
The DT thanks you for your support.	
Diana Aguas - CenterPoint Energy Houston Electric, LLC - 1 - Texas RE	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	

Response	
The Drafting Team thanks you for your support.	
Leslie Hamby - Southern Indiana Gas and Electric Co. - 3,5,6 - RF	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
The DT thanks you for your support.	
Kinte Whitehead - Exelon - 1,3	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
The DT thanks you for your support.	
Mike Magruder - Avista - Avista Corporation - 1	
Answer	Yes
Document Name	
Comment	

Likes 0	
Dislikes 0	
Response	
The DT thanks you for your support.	
Charles Yeung - Southwest Power Pool, Inc. (RTO) - 2 - MRO,WECC, Group Name SRC 2023	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
The DT thanks you for your support.	
Kennedy Meier - Electric Reliability Council of Texas, Inc. - 2	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
The DT thanks you for your support.	
Tim Kelley - Tim Kelley On Behalf of: Charles Norton, Sacramento Municipal Utility District, 3, 6, 4, 1, 5; Foung Mua, Sacramento Municipal Utility District, 3, 6, 4, 1, 5; Kevin Smith, Balancing Authority of Northern California, 1; Nicole Looney, Sacramento Municipal	

Utility District, 3, 6, 4, 1, 5; Ryder Couch, Sacramento Municipal Utility District, 3, 6, 4, 1, 5; Wei Shao, Sacramento Municipal Utility District, 3, 6, 4, 1, 5; - Tim Kelley, Group Name SMUD and BANC	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
The DT thanks you for your support.	
Marty Hostler - Northern California Power Agency - 4	
Answer	
Document Name	
Comment	
1. NO. We believe the SDT needs to explain or clarify what "the electric system" is and how an IBR relates to the Bulk Electric System.	
Likes 0	
Dislikes 0	
Response	
Thank you for the comment, we will be sure that this is passed along to the DT.	

2. *Do you support the definition for IBR Unit 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*.
Tim Kelley - Tim Kelley On Behalf of: Charles Norton, Sacramento Municipal Utility District, 3, 6, 4, 1, 5; Foung Mua, Sacramento Municipal Utility District, 3, 6, 4, 1, 5; Kevin Smith, Balancing Authority of Northern California, 1; Nicole Looney, Sacramento Municipal Utility District, 3, 6, 4, 1, 5; Ryder Couch, Sacramento Municipal Utility District, 3, 6, 4, 1, 5; Wei Shao, Sacramento Municipal Utility District, 3, 6, 4, 1, 5; - Tim Kelley, Group Name SMUD and BANC

Answer	No
Document Name	

Comment
SMUD supports the creation of a definition for “IBR Unit” since it is highly likely that drafting teams for other NERC Standards Projects related to inverter-based resources will need the flexibility to draft requirements that apply specifically to the power electronic interface equipment, and not to the entire inverter-based resource facility. The proposed definition for IBR Unit is excessively complicated. We recommend the drafting team consider the following changes to the proposed definition: “An individual device**, or grouping of multiple devices,** that uses a power electronic interface, such as an inverter or converter, capable of exporting Real Power **and of providing Reactive Power support** from a primary energy source or energy storage system, and that connects at a single point on **a** collector system.”

Likes 0	
Dislikes 0	

Response
Thank you for the comment. The DT decides to remove the separate definition for "IBR Unit" based on the industrial comments. The "IBR" definition is revised to include the description of individual devices. Examples of IBR are listed.
Amy Wilke - American Transmission Company, LLC - 1

Answer	No
Document Name	
Comment	

Additional clarity should be provided to this definition. There is some confusion right now without more context of the technical rationale document included in the standard itself. As stated right now, an IBR unit can be an individual device or multiple devices and while the Technical Rationale examples and pictures make it fairly clear, more clarity in the definition language would be helpful. Perhaps stating that an IBR unit is one that connects together behind the same generator step up transformer (IBR Unit transformer). Edits are also provided below.

NERC Proposed Definition - Inverter-Based Resource unit (IBR Unit): An individual device that uses a power electronic Interface, such as an inverter or converter, capable of exporting Real Power from a primary energy source or energy storage system, and that connects at a single point on the collector system: or a grouping of multiple devices that uses a power electronic interface(s), such as an inverter or converter, capable of exporting Real Power from a primary energy source or energy storage system, and that connect together at a single point on the collector system.

ATC Proposed edit - Inverter-Based Resource Unit (IBR Unit): An individual device or grouping of multiple devices that uses a power electronic interface, such as an inverter or converter, capable of exporting Real Power from a primary energy source or energy storage system, and that connects behind the same IBR Unit step up transformer.

Likes 0	
Dislikes 0	
Response	

Thank you for the comment. The DT decides to remove the separate definition for "IBR Unit" based on the industrial comments.

The "IBR" definition is revised to include the description of individual devices. Examples of IBRs are listed.

Joshua Phillips - Southwest Power Pool, Inc. (RTO) - 2

Answer	No
Document Name	
Comment	

SPP has a concern that the proposed definition potentially places a limit only holding an account for Real Power instead of Reactive Power.

We recommend that the drafting team replace the term “Real Power” with power, that aligns with the BES definition for generation (inclusion).

Likes 0	
Dislikes 0	

Response

Thank you for the comment, this will be passed along to the DT for consideration when drafting the new IBR definition.

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 believe the currently proposed IBR Unit definition contains language that overlaps the proposed IBR (a.k.a. IBR Facility) definition and should be modified. It is our opinion that the definition of an IBR Unit should utilize a standalone, technologically agnostic, approach that is consistent with language already utilized elsewhere in the NERC Glossary of Terms.

Furthermore, it is the opinion of ACES that the reference to “a grouping of multiple devices” is confusing. We believe that the intent of the SDT was to encompass all possible configurations of IBR Units; however, we do not believe the current language meets said intent succinctly enough. Moreover, there are no other definitions that attempt to define generating units with such a level of specificity. For instance, there are no definitions within the NERC Glossary of Terms that attempt to define the many various configurations of a combined cycle unit (e.g., 1x1, 2x1, 3x2, 4x1, etc.). Hence, in this instance, we believe that less is more.

Therefore, it is our recommendation that the IBR Unit definition be modified as follows:

Inverter-Based Resource (IBR) Unit: An individual generating resource capable of exporting Real Power that uses a power electronic interface, such as an inverter or rectifier, and connects at a single point to a system designed primarily for delivering such Real Power to a common point of interconnection.

Likes 0	
Dislikes 0	
Response	
Thank you for the comment. The DT decides to remove the separate definition for "IBR Unit" based on the industrial comments. The "IBR" definition is revised to include the description of individual devices. Examples of IBRs are listed.	
Lauren Giordano - Lauren Giordano On Behalf of: Dennis Sismaet, Northern California Power Agency, 4, 6, 3, 5; Jeremy Lawson, Northern California Power Agency, 4, 6, 3, 5; Marty Hostler, Northern California Power Agency, 4, 6, 3, 5; - Lauren Giordano	
Answer	No
Document Name	
Comment	
If the SDT is going to use the proposed definition the language "single point on the collector system" should be revised to "single point on a collector system bus that meets the BES definition."	
Likes 0	
Dislikes 0	
Response	
Thank you for the comment. The DT decides to remove the separate definition for "IBR Unit" based on the industrial comments. The "IBR" definition is revised to include the description of individual devices. Examples of IBRs are listed.	
Wayne Sipperly - North American Generator Forum - 5 - MRO,WECC,Texas RE,NPCC,SERC,RF	
Answer	No
Document Name	
Comment	

The NAGF recommends that having an IBR unit definition is unnecessary. Please see the response to Question #1. In addition, the NAGF points out that the SDT has said there is no need to define "collector system" as everyone understands what that term means. The SDT is also attempting to use a term that industry understands and uses, "unit", to mean something much different than how the term is currently used in the operations arena of the industry. This is unacceptable as it will likely lead to significant confusion and misunderstanding in the implementation of the standards.	
Likes 0	
Dislikes 0	
Response	
Thank you for the comment. The DT decides to remove the separate definition for "IBR Unit" based on the industrial comments. The "IBR" definition is revised to include the description of individual devices. Examples of IBRs are listed.	
Leslie Hamby - Southern Indiana Gas and Electric Co. - 3,5,6 - RF	
Answer	No
Document Name	
Comment	
Renewable generation must at some point cover Reactive Power if we are moving towards all renewable generation in the future. Due to this, Southern Indiana Gas & Electric, Company recommends adding "Reactive Power" to the definition.	
Likes 0	
Dislikes 0	
Response	
Thank you for the comment, the DT will take this into consideration when drafting the new version of the definition for IBR.	
Dwanique Spiller - Berkshire Hathaway - NV Energy - 5	
Answer	No
Document Name	

Comment	
See Question 1.	
Likes 0	
Dislikes 0	

Response	
Thank you for the comment. The DT decides to remove the separate definition for "IBR Unit" based on the industrial comments. The "IBR" definition is revised to include the description of individual devices. Examples of IBRs are listed.	
Carver Powers - Utility Services, Inc. - 4	
Answer	No
Document Name	
Comment	
Suggest changing the term name from IBR Unit to Inverter Based Unit (IBU) for clarity in the proposed IBR definition. The proposed definition is structured in a way that make it difficult to understand. The following is the definition using the NERC style guide… in part. 1) An individual device that uses a power electronic interface, such as an inverter or converter, capable of exporting Real Power from a primary energy source or energy storage system, and 2) that connects at a single point on the collector system; or 1) A grouping of multiple devices that uses a power electronic interface(s), such as an inverter or converter, capable of exporting Real Power from a primary energy source or energy storage system, and 2) that connect together at a single point on the collector system.	

Based on this interpretation of the proposed definition, the following definition would mean the same but be simpler to understand. This modified definition also includes the list of primary energy sources and BESS from the IBR definition “An individual device or grouping of devices that: 1) use a power electronic interface, such as an inverter or converter, capable of exporting Real Power from a primary energy source or energy storage system (e.g. solar photovoltaic devices, Type 3 and Type 4 wind turbines, battery energy storage systems, and fuel cells) and 2) connect at a single point on a collector system;” It could also be structured this way: “An individual device or grouping of devices that utilize a power electronic interface, such as an inverter or converter, capable of exporting Real Power from a primary energy source or energy storage system (e.g., solar photovoltaic devices, Type 3 and Type 4 wind turbines, battery energy storage systems, and fuel cells) and connecting at a single point on a collector system.”	
Likes 0	
Dislikes 0	
Response	
Thank you for the comment, The DT decides to remove the separate definition for "IBR Unit" based on the industry comments. The "IBR" definition is revised to include the description of individual devices. Examples of IBRs are listed.	
Donna Wood - Tri-State G and T Association, Inc. - 1	
Answer	No
Document Name	
Comment	
Tri-State Generation and Transmission supports the comments of the MRO NSRF.	
Likes 0	

Dislikes 0	
Response	
Thank you for the comment, please see the response to MRO NSRF's comment.	
Dennis Chastain - Tennessee Valley Authority - 1,3,5,6 - SERC	
Answer	No
Document Name	
Comment	
The Draft 2 "IBR Unit" definition states that it's a device that uses a power electronic interface. The IBR Unit doesn't use the interface, it is the interface. As such, suggest changing the words "that uses" to "consisting of" such that the definition would now read: "An individual device **consisting of** a power electronic interface, such as an inverter or converter, capable of exporting Real Power from a primary energy source or energy storage system, and that connects at a single point on the collector system; or a grouping of multiple devices **consisting of** power electronic interface(s), such as inverters or converters, capable of exporting Real Power from a primary energy source or energy storage system, and that connect together at a single point on the collector system."	
Likes 0	
Dislikes 0	
Response	
Thank you for the comment. The DT decides to remove the separate definition for "IBR Unit" based on the industrial comments. Thank you for the suggestion and will be noted if the team decides to reconsider IBR Unit.	
Christine Kane - WEC Energy Group, Inc. - 3, Group Name WEC Energy Group	
Answer	No
Document Name	
Comment	

WEC Energy Group supports the comments of the MRO NSRF.	
Likes 0	
Dislikes 0	
Response	
Thank you for the comment, please refer to the response to MRO NSRF's comment.	
Andy Thomas - Duke Energy - 1,3,5,6 - SERC,RF	
Answer	No
Document Name	
Comment	
See Question #1 Response.	
Likes 0	
Dislikes 0	
Response	
Thank you for the comment.	
Anna Martinson - MRO - 1,2,3,4,5,6 - MRO, Group Name MRO Group	
Answer	No
Document Name	
Comment	
See Question 1.	
Likes 0	
Dislikes 0	

Response	
Thank you for the comment.	
Srikanth Chennupati - Entergy - Entergy Services, Inc. - 1,3,5,6 - SERC	
Answer	No
Document Name	
Comment	
Entergy believes that having an IBR Unit definition is unnecessary. Entergy is concerned that the potential level of granularity in the IBR Unit definition makes compliance overly burdensome due to the need to perform compliance activities on a device-by-device basis. An IBR facility can have hundreds of individual IBR Units as it is currently defined. Where standard requirements need to be applied at the inverter level, then the individual standards should state that.	
Likes 0	
Dislikes 0	
Response	
Thank you for the comment. The DT decides to remove the separate definition for "IBR Unit" based on the industry comments.	
Israel Perez - Israel Perez On Behalf of: Mathew Weber, Salt River Project, 3, 1, 6, 5; Sarah Blankenship, Salt River Project, 3, 1, 6, 5; Thomas Johnson, Salt River Project, 3, 1, 6, 5; Timothy Singh, Salt River Project, 3, 1, 6, 5; - Israel Perez	
Answer	No
Document Name	
Comment	
SRP does not support the addition or modification 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	
Thank you for the comments and opinions.	
Jennifer Bray - Arizona Electric Power Cooperative, Inc. - 1	
Answer	No
Document Name	
Comment	

AEPC has signed on to ACES comments:

We believe the currently proposed IBR Unit definition contains language that overlap the proposed IBR (a.k.a. IBR Facility) definition and should be modified. It is our opinion that the definition of an IBR Unit should utilize a standalone, technologically agnostic, approach that is
consistent with language already utilized elsewhere in the NERC Glossary of Terms.

Furthermore, it is the opinion of ACES that the reference to “a grouping of multiple devices” is confusing. We believe that the intent of the SDT was to encompass all possible configurations of IBR Units; however, we do not believe the current language meets said intent succinctly enough.

Moreover, there are no other definitions that attempt to define generating units with such a level of specificity. For instance, there are no definitions within the NERC Glossary of Terms that attempt to define the many various configurations of a combined cycle unit (e.g., 1x1, 2x1, 3x2, 4x1, etc.). Hence, in this instance, we believe that less is more.

Therefore, it is our recommendation that the IBR Unit definition be modified as follows:

- **Inverter-Based Resource (IBR) Unit**: An individual generating resource capable of exporting Real Power that uses a power electronic interface, such as an inverter or rectifier, and connects at a single point to a system designed primarily for delivering such Real Power to a common point of interconnection.

Likes 0	
Dislikes 0	
Response	

Thank you for the comment. The DT decides to remove the separate definition for "IBR Unit" based on the industry comments. This is noted for the future if IBR Unit is being reconsidered.	
Rachel Schuldt - Black Hills Corporation - 6, Group Name Black Hills Corporation - All Segments	
Answer	No
Document Name	
Comment	
Black Hills Corporation does not believe a definition for “IBR Unit” is necessary if the “IBR” definition from Question 1 is revised as mentioned. The use of the term “unit” may conflict with other industry uses of the term. If necessary to define to an individual level, then consider use of the term “element” or “device” in place of “unit.”	
Likes 0	
Dislikes 0	
Response	
Thank you for the comment.	
Adrian Andreoiu - BC Hydro and Power Authority - 1, Group Name BC Hydro	
Answer	No
Document Name	
Comment	
Per the latest revision, the IBR Unit definition references ‘an individual device … that connects at a single point on the collector system’. BC Hydro appreciates the clarification provided during the SDT webinar that this addition was to correct grammar. However, it does not seem to add value as a single device will not have multiple connection points to a single system. It is also not clear why the IBR Unit definition needs to be dependent on “the collector system”, which is not a defined term. As the IBR definition already specifies the requirement of “a common point of interconnection”, we posit that would be sufficient to define the IBR.	

BC Hydro suggests that the collector system concept is not necessary to define the IBR Unit: the examples provided in the Technical Rationale (Figures 2.1, 2.2, and 2.3 on pages 3-4) seem to indicate that it is the single AC bus that determines the interface between an IBR Unit and the electric power system. However, if the "collector system" is to be deemed a critical component for defining an IBR Unit, BC Hydro suggests that this be defined as a NERC Glossary Term instead of relying on a common understanding in the power industry.

During the SDT webinar's Q&A session clarifications were provided to the effect that an Electric Vehicle (EV) can be deemed an IBR Unit if bidirectional, i.e., injecting power into the grid, not just charging. Arguably, the collector system concept may be different in such scenarios.

BC Hydro suggests that the simplified definitions proposed below do not miss any critical element to fully define the IBR facilities.

IBR Unit – an individual device or a grouping of multiple devices that can export Real Power from a primary energy source or energy storage system via a power electronics interface.

IBR – a plant including an individual IBR Unit or multiple IBR Units operated as a single resource connected to the electric power system at a common point of connection.

Likes 0	
Dislikes 0	

Response

Thank you for the comment, these will be considered when drafting the new IBR definition. The IBR Unit term will not be balloted this next posting.

Kristina Marriott - Miller Bros. Solar, LLC - 5 - MRO,WECC,Texas RE

Answer	No
Document Name	

Comment

MBS aligns with the previous submission responses made by the NAGF, and feels that the SDT did not address this concern nor provide clarity:

Utilizing the term IBR Unit to refer to a single inverter within the generating plant will cause significant confusion at the plant level. Unless any instruction provided to the plant is written, then it will not be clear if the term IBR Unit is the defined term used by NERC or if it is intended to mean the generating unit (Unit 1, 2 or 3), IBR unit. This level of potential confusion is unacceptable resulting in an unacceptable risk of the BES being mis operated. The word “unit” has long been associated with a distinct operating segment of a plant. For this reason, the NAGF does not support the use of the term unit to mean anything less than the dispatchable grouping of inverters. MBS further supports TRE previous response: ...the current verbiage of IBR Unit does not include the capabilities for absorbing or delivering reactive power which is essential for electric system operations.	
Likes 0	
Dislikes 0	
Response	
Thank you for the comment. The DT decides to remove the separate definition for "IBR Unit" based on the industry comments. The "IBR" definition is revised to include the description of individual devices. Examples of IBRs are listed.	
Sean Bodkin - Dominion - Dominion Resources, Inc. - 6, Group Name Dominion	
Answer	No
Document Name	
Comment	
Dominion Energy is if the opinion that this defintion should be simplifed similiar to the proposed IBR defintion in Q1. **Inverter-Based Resource Unit (IBR Unit):** An individual **inverter** device or a grouping of multiple inverters connected together **operating functionally as a single unit, and directly connected at a single point of interconnection to the Bulk Power System at 60kV and above.**	
Likes 0	
Dislikes 0	
Response	
Thank you for the comments and the suggestion.	

Ryan Quint - Elevate Energy Consulting - NA - Not Applicable - NA - Not Applicable, Group Name Elevate Energy Consulting	
Answer	No
Document Name	
Comment	
The definition appears to be overcomplicated and unnecessarily confusing. It is unclear why the definition could not simply state: "An individual device, or a grouping of multiple devices, that uses a power electronic interface(s), such as an inverter or converter, capable of exporting Real Power from a primary energy source or energy storage system, and that connects at a single point on the collector system."	
Likes 0	
Dislikes 0	
Response	
Thank you for the feedback and input.	
Mark Gray - Edison Electric Institute - NA - Not Applicable - NA - Not Applicable	
Answer	Yes
Document Name	
Comment	
EEI has no objections to the IBR Unit definition as proposed.	
Likes 0	
Dislikes 0	
Response	
Thank you for the support.	
Steven Rueckert - Western Electricity Coordinating Council - 10, Group Name WECC Entity Monitoring	
Answer	Yes

Document Name	
Comment	
WECC has no issue with the definition, but urges that care needs to be taken when using the term in Requirements. WECC appreciated the approach taken by the SDT to distinguish the two terms.	
Likes 0	
Dislikes 0	
Response	
Thank you for the support.	
Mark Garza - FirstEnergy - FirstEnergy Corporation - 4, Group Name FE Voter	
Answer	Yes
Document Name	
Comment	
No comment.	
Likes 0	
Dislikes 0	
Response	
Thank you for the support.	
Colby Galloway - Southern Company - Southern Company Services, Inc. - 1,3,5,6 - SERC, Group Name Southern Company	
Answer	Yes
Document Name	
Comment	

See the suggestion to change **IBR Unit** to **IBR Device** in Q4 below. It is suggested that the SDT carefully consider the use of the word "unit" to refer to both the power conversion element when unit is capitalized versus using unit to refer to the entire facility when not capitalized.

Likes 0	
Dislikes 0	

Response
Thank you for the comment. The DT decides to remove the separate definition for "IBR Unit" based on the industry comments. The "IBR" definition is revised to include the description of individual devices. Examples of IBRs are listed.

Junji Yamaguchi - Hydro-Quebec (HQ) - 5	
Answer	Yes
Document Name	

Comment
Another remark would be that while reading the overall definitions, it doesn't seem clear that E-statcoms are not included in the scope of the term IBR Unit. Perhaps a distinction between STATCOMs and E-STATCOMS should be added to the Technical Rationale depending on the energy that can be stored or the storage technology used (supercaps-short duration vs batteries- long duration). Without this distinction, there exists a risk that a storage system could be identified as a E-STATCOM and thus avoid certain requirements.

Likes 0	
Dislikes 0	

Response
Thank you for the comment, the IBR Unit will not be posted in the new ballot period.

Chantal Mazza - Chantal Mazza On Behalf of: Nicolas Turcotte, Hydro-Quebec (HQ), 1, 5; - Chantal Mazza	
Answer	Yes
Document Name	

Comment	
While reading the overall definitions, it doesn't seem clear that E-statcoms are not included in the scope of the term IBR Unit. Perhaps a distinction between STATCOMs and E-STATCOMS should be added to the Technical Rationale depending on the energy that can be stored or the storage technology used (supercaps-short duration vs batteries- long duration). Without this distinction, there exists a risk that a storage system could be identified as a E-STATCOM and thus avoid certain requirements.	
Likes 0	
Dislikes 0	
Response	
Thank you for the comment. The DT decides to remove the separate definition for "IBR Unit" based on the industry comments. The "IBR" definition is revised to include the description of individual devices. Examples of IBRs are listed.	
Dave Krueger - SERC Reliability Corporation - 10	
Answer	Yes
Document Name	
Comment	
On behalf of the SERC Generator Working Group: Suggest changing the word "unit" to "asset" to avoid confusion with the historical meaning of unit	
Likes 0	
Dislikes 0	
Response	
Thank you for the comments and suggestions.	
Daniela Atanasovski - APS - Arizona Public Service Co. - 1	
Answer	Yes
Document Name	

Comment	
None	
Likes 0	
Dislikes 0	
Response	
Thank you for the support.	
Michael Johnson - Michael Johnson On Behalf of: Marco Rios, Pacific Gas and Electric Company, 3, 1, 5; Sandra Ellis, Pacific Gas and Electric Company, 3, 1, 5; Tyler Brun, Pacific Gas and Electric Company, 3, 1, 5; - Michael Johnson, Group Name PG&E All Segments	
Answer	Yes
Document Name	
Comment	
PG&E supports the IBR Unit definition.	
Likes 0	
Dislikes 0	
Response	
Thank you for the comment.	
Kennedy Meier - Electric Reliability Council of Texas, Inc. - 2	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	

Response	
Thank you for the support.	
Charles Yeung - Southwest Power Pool, Inc. (RTO) - 2 - MRO,WECC, Group Name SRC 2023	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Thank you for the support.	
Mike Magruder - Avista - Avista Corporation - 1	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Thank you for the support.	
Kinte Whitehead - Exelon - 1,3	
Answer	Yes
Document Name	
Comment	

Likes 0	
Dislikes 0	
Response	
Thank you for the support.	
Diana Aguas - CenterPoint Energy Houston Electric, LLC - 1 - Texas RE	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Thank you for the support.	
Ruida Shu - Northeast Power Coordinating Council - 1,2,3,4,5,6,7,8,9,10 - NPCC, Group Name NPCC RSC	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Thank you for the support.	
David Jendras Sr - Ameren - Ameren Services - 3	

Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Thank you for the support.	
Cain Braveheart - Bonneville Power Administration - 1,3,5,6 - WECC	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Thank you for the support.	
Casey Perry - PNM Resources - 1,3 - WECC,Texas RE	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	

Response	
Thank you for the support.	
Matt Lewis - Lower Colorado River Authority - 1,5	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Thank you for the support.	
Teresa Krabe - Lower Colorado River Authority - 5	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Thank you for the support.	
Mohamad Elhusseini - DTE Energy - Detroit Edison Company - 3,5	
Answer	Yes
Document Name	
Comment	

Likes 0	
Dislikes 0	
Response	
Thank you for the support.	
Pirouz Honarmand - Pirouz Honarmand On Behalf of: Helen Lainis, Independent Electricity System Operator, 2; - Pirouz Honarmand	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Thank you for the support.	
Duane Franke - Manitoba Hydro - 1,3,5,6 - MRO	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Thank you for the support.	
Thomas Foltz - AEP - 5	

Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Thank you for the support.	
Marty Hostler - Northern California Power Agency - 4	
Answer	
Document Name	
Comment	
1. No. If the SDT is going to use the proposed definition the language "single point on the collector system" should be revised to "single point on a collector system bus that meets the BES definition."	
Likes 0	
Dislikes 0	
Response	
Thank you for the comments and suggestions.	
Megan Melham - Decatur Energy Center LLC - 5	
Answer	
Document Name	
Comment	
Capital Power supports the NAGF comments for the IBR Unit definition as below:	

The NAGF recommends that having an IBR unit definition is unnecessary. Please see the response to Question #1. In addition, the NAGF points out that the SDT has said there is no need to define “collector system” as everyone understands what that term means. The SDT is also attempting to use a term that industry understands and uses, “unit”, to mean something much different than how the term is currently used in the operations arena of the industry. This is unacceptable as it will likely lead to significant confusion and misunderstanding in the implementation of the standards.	
Likes 0	
Dislikes 0	
Response	
Thank you for the comment, please refer to the response to NAGF’s comment.	

3. ***As discussed in the Technical Rationale, the proposed definitions would define the scope of equipment, but would not define the scope of IBR units subject to mandatory compliance with Reliability Standards. Each standard would define the applicable units subject to compliance with that standard. An example to include both BES and non-BES IBRs is as follows:***   ***Section 4. Applicability:***   ***4.1 Functional Entities: Generator Owner, Generator Operator***   ***4.1 Facilities: (1) BES Inverter-Based Resources; and (2) Non-BES Inverter Based Resources (IBRs) that that either have or contribute to an aggregate nameplate capacity of greater than or equal to 20 MVA, connected through a system designed primarily for delivering such capacity to a common point of connection at a voltage greater than or equal to 60 kV.***   ***Provide any suggested revisions you feel would improve the readability of this example*****.**

Sean Bodkin - Dominion - Dominion Resources, Inc. - 6, Group Name Dominion	
Answer	No
Document Name	
Comment	
The BES definition should govern applicability and individual standards should not be conflicting with an approved definition.	
Likes 0	
Dislikes 0	
Response	
Thank you for the comment.	
Israel Perez - Israel Perez On Behalf of: Mathew Weber, Salt River Project, 3, 1, 6, 5; Sarah Blankenship, Salt River Project, 3, 1, 6, 5; Thomas Johnson, Salt River Project, 3, 1, 6, 5; Timothy Singh, Salt River Project, 3, 1, 6, 5; - Israel Perez	
Answer	No
Document Name	

Comment	
SRP does not support the addition or modification 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. In addition, 4.1 Facilities definition has redundant "that" in its description.	
Likes 0	
Dislikes 0	
Response	
Thank you for the comment, this comment will be passed along to the DT for consideration when drafting.	
Srikanth Chennupati - Entergy - Entergy Services, Inc. - 1,3,5,6 - SERC	
Answer	No
Document Name	
Comment	
None	
Likes 0	
Dislikes 0	
Response	
Thank you for the comment.	
Andy Thomas - Duke Energy - 1,3,5,6 - SERC,RF	
Answer	No
Document Name	
Comment	
The 60 kV voltage threshold value will limit the application of resources. Please consider reducing the voltage value to 40 kV.	

Additionally, the NERC Glossary of Terms “Bulk Electric System” definition I2A for synchronous machines uses the phrase: “a) Gross individual nameplate rating ‘greater’ than 20 MVA”; suggest changing 20 MVA language to “4.1 Facilities: (1) BES Inverter-Based Resources; and (2) Non-BES Inverter Based Resources (IBRs) that that either have or contribute to an aggregate nameplate capacity of ‘greater' than 20 MVA,” to consolidate language and reduce confusion with the implied 20 MVA value.	
Likes 0	
Dislikes 0	
Response	
Thank you for the feedback, the DT and NERC will take these into consideration.	
Carver Powers - Utility Services, Inc. - 4	
Answer	No
Document Name	
Comment	
Recommend that the proposed language for Section 4.1 Facilities, part 2 align with the pending GO/GOP NERC Glossary of Terms revisions and the pending compliance registry definitions.	
Likes 0	
Dislikes 0	
Response	
Thank you for the comment, the comment will be passed along for consideration.	
Megan Melham - Decatur Energy Center LLC - 5	
Answer	No
Document Name	
Comment	
Capital Power supports the NAGF comments as below:	

The NAGF recommends that the proposed language for Section 4.1 Facilities, part 2 align with the pending GO/GOP NERC Glossary of Terms revisions.	
Likes 0	
Dislikes 0	
Response	
Thank you for the comment, this will be passed along to the DT be taken into consideration.	
Marty Hostler - Northern California Power Agency - 4	
Answer	No
Document Name	
Comment	
No. Should not say 60 KV. Industry, NERC, and FERC agreed a long time ago on 100 KV.	
Likes 0	
Dislikes 0	
Response	
Thank you for the comment, this will be passed along for consideration.	
Wayne Sipperly - North American Generator Forum - 5 - MRO,WECC,Texas RE,NPCC,SERC,RF	
Answer	No
Document Name	
Comment	
The NAGF recommends that the proposed language for Section 4.1 Facilities, part 2 align with the pending GO/GOP NERC Glossary of Terms revisions.	
Likes 0	

Dislikes 0	
Response	
Thank you for the comment and for the recommendation. This will be passed along for consideration.	
Lauren Giordano - Lauren Giordano On Behalf of: Dennis Sismaet, Northern California Power Agency, 4, 6, 3, 5; Jeremy Lawson, Northern California Power Agency, 4, 6, 3, 5; Marty Hostler, Northern California Power Agency, 4, 6, 3, 5; - Lauren Giordano	
Answer	No
Document Name	
Comment	
Should not say 60 KV. Industry, NERC, and FERC agreed a long time ago on 100 KV.	
Likes 0	
Dislikes 0	
Response	
Thank you for the comment, this will be passed along for consideration.	
Joshua Phillips - Southwest Power Pool, Inc. (RTO) - 2	
Answer	No
Document Name	
Comment	
SPP has concern that the approach of each standard defining the applicable units may create conflicting issues amongst various standards. This one-off concept (not being defined in the glossary of terms or Rules of Procedure RoP) could cause confusion and will not have a solid reference outside of the actual language located in the standard. For example, if a standard is retired that uses this concept, it could create a gap in the IBR process and may require the reopening of various standards. Our concerns include the current BES definition properly aligning among this drafting team and drafting team efforts that are focused on the Inverter-Based Resource (IBR). The current definition does not take into consideration the IBR characteristics and impacts.	

With that said, SPP recommends that the drafting team ensure the definitions of what is included and excluded within the BES definitions for proper alignment with other NERC standards in reference to the new technology and its impact on the reliability of the grid.	
Likes 0	
Dislikes 0	
Response	
Thank you for the comment, this will be passed along for consideration for the next ballot. The DT will consider the removal of the term, "IBR UNIT" for next ballot	
Tim Kelley - Tim Kelley On Behalf of: Charles Norton, Sacramento Municipal Utility District, 3, 6, 4, 1, 5; Foung Mua, Sacramento Municipal Utility District, 3, 6, 4, 1, 5; Kevin Smith, Balancing Authority of Northern California, 1; Nicole Looney, Sacramento Municipal Utility District, 3, 6, 4, 1, 5; Ryder Couch, Sacramento Municipal Utility District, 3, 6, 4, 1, 5; Wei Shao, Sacramento Municipal Utility District, 3, 6, 4, 1, 5; - Tim Kelley, Group Name SMUD and BANC	
Answer	No
Document Name	
Comment	
The format proposed by the Standard Drafting Team (SDT) is a good way to define applicability within each Standard, however, we feel that the language proposed in NERC Standards Project 2021-04 Modifications to PRC-002 - Phase II, PRC-028-1 draft #2, is even better. This language is formatted as follows: **"4.1. Functional Entities:** 4.1.1. Generator Owner *that owns equipment as identified in section 4.2* [emphasis added] 4.1.2. Generator Operator *that operates equipment as identified in section 4.2* [emphasis added] **4.2. Facilities:** The Elements associated with (1) BES Inverter-Based Resources; and (2) Non-BES Inverter-Based Resources that either have or contribute to an aggregate nameplate capacity of greater than or equal to 20 MVA, connected through a system designed primarily for delivering such capacity to a common point of connection at a voltage greater than or equal to 60 kV."	
Likes 0	

Dislikes 0	
Response	
Thank you for the comment, this will be passed along to the DT for consideration.	
Ryan Quint - Elevate Energy Consulting - NA - Not Applicable - NA - Not Applicable, Group Name Elevate Energy Consulting	
Answer	Yes
Document Name	
Comment	
Slight editorial changes such as : 1) There are two "4.1" in Section 4, which is in error we believe. 2) The acronym "(IBR)" should be on the first use of the term, not the second. 3) It states "that that" after the current use of (IBR) presently.	
Likes 0	
Dislikes 0	
Response	
Thank you for the support, and this comment will be passed along and taken into consideration.	
Michael Johnson - Michael Johnson On Behalf of: Marco Rios, Pacific Gas and Electric Company, 3, 1, 5; Sandra Ellis, Pacific Gas and Electric Company, 3, 1, 5; Tyler Brun, Pacific Gas and Electric Company, 3, 1, 5; - Michael Johnson, Group Name PG&E All Segments	
Answer	Yes
Document Name	
Comment	
PG&E has no suggested revisions that could improve the readability of the Applicability except for making “Facility” 4.2 and not 4.1.	
Likes 0	

Dislikes 0	
Response	
Thank you for the comments and support.	
Donna Wood - Tri-State G and T Association, Inc. - 1	
Answer	Yes
Document Name	
Comment	
Tri-State Generation and Transmission supports the comments of the MRO NSRF.	
Likes 0	
Dislikes 0	
Response	
Please see the response to MRO NSRF's comment.	
David Jendras Sr - Ameren - Ameren Services - 3	
Answer	Yes
Document Name	
Comment	
Ameren would like an example of how they use IBR unit in a compliance definition, for example in PRC-029 for a plant where you have mixed types of IBR units.	
Likes 0	
Dislikes 0	
Response	
Thank you for commenting, the use of IBR Unit was used in PRC-028. IBR Unit will not be balloted this additional ballot.	
Dwanique Spiller - Berkshire Hathaway - NV Energy - 5	

Answer	Yes
Document Name	
Comment	
NV Energy agrees that the applicability section and/or actual requirements should define the scope of equipment included/excluded whether it be a Category 1 GO/GOP or Category 2 GO/GOP, as Defined in the proposed NERC ROP.	
Likes 0	
Dislikes 0	
Response	
Thank you for the comment, the DT has made changes to better clarify applicability. This suggestion will be passed along for consideration.	
Mark Garza - FirstEnergy - FirstEnergy Corporation - 4, Group Name FE Voter	
Answer	Yes
Document Name	
Comment	
No Comments.	
Likes 0	
Dislikes 0	
Response	
Thank you for the support.	
Pirouz Honarmand - Pirouz Honarmand On Behalf of: Helen Lainis, Independent Electricity System Operator, 2; - Pirouz Honarmand	
Answer	Yes
Document Name	
Comment	

Likes 0	
Dislikes 0	
Response	
Thank you for the support.	
Mohamad Elhusseini - DTE Energy - Detroit Edison Company - 3,5	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Thank you for the support.	
Kristina Marriott - Miller Bros. Solar, LLC - 5 - MRO,WECC,Texas RE	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Thank you for the support.	
Teresa Krabe - Lower Colorado River Authority - 5	

Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Thank you for the support.	
Casey Perry - PNM Resources - 1,3 - WECC,Texas RE	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Thank you for the support.	
Dave Krueger - SERC Reliability Corporation - 10	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	

Response	
Thank you for the support.	
Ruida Shu - Northeast Power Coordinating Council - 1,2,3,4,5,6,7,8,9,10 - NPCC, Group Name NPCC RSC	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	

Response	
Thank you for the support.	
Adrian Andreoiu - BC Hydro and Power Authority - 1, Group Name BC Hydro	
Answer	
Document Name	
Comment	

BC Hydro sees a potential conflict between IBR as defined here and the recent updates to the NERC Rules of Procedure to the Generator Owner and Operator definitions.

In the current draft of the NERC Rules of Procedure – Appendix 2 Definitions used in the Rules of Procedure and Appendix 5B Statement of Compliance Registry Criteria (Revision 8), the Category 2 Generator Owner entity is defined as “owns and maintains non-BES inverter based **generating resources** (emphasis added) that either have or contribute to an aggregate nameplate capacity of greater than or equal to 20 MVA, connected through a system designed primarily for delivering such capacity to a common point of connection at a voltage greater than or equal to 60 kV (Category 2 GO)”.

BC Hydro appreciates the discussion at item #3 in the Technical Rationale. However, depending on the interpretation of “generating resources”, owners of certain IBR types such as battery energy storage systems (BESS) or Electric Vehicles may not be registered as a GO for these facilities. This would create a potential discrepancy between definitions which may create a gap in the intended scope of

applicability for MOD-026-2 and potentially other reliability standards, i.e., entities that would be included under the applicability section of the standard wouldn't be part of the MRS Program as they may not be registered if they don't meet the GO definition.	
Likes 0	
Dislikes 0	
Response	
Thank you for the feedback, the DT and NERC will take these into consideration when updating definition, and TR.	
Rachel Schuldt - Black Hills Corporation - 6, Group Name Black Hills Corporation - All Segments	
Answer	
Document Name	
Comment	
Black Hills Corporation recommends that the proposed language for "Section 4.1. Facilities" be updated to align with the pending GO & GOP definition revisions in the NERC Rules of Procedure.	
Likes 0	
Dislikes 0	
Response	
Thank you for the support, the DT will take this into consideration.	
Daniela Atanasovski - APS - Arizona Public Service Co. - 1	
Answer	
Document Name	
Comment	
None	
Likes 0	

Dislikes 0	
Response	
Thank you for the comment.	
Jennifer Bray - Arizona Electric Power Cooperative, Inc. - 1	
Answer	
Document Name	
Comment	
AEPC has signed on to ACES comments: We recommend modifying Section 4.1 Functional Entities to specifically reference the new Category 1 GO/GOP and Category 2 GO/GOP definitions.	
Likes 0	
Dislikes 0	
Response	
Thank you for the support, the DT will take this into consideration.	
Anna Martinson - MRO - 1,2,3,4,5,6 - MRO, Group Name MRO Group	
Answer	
Document Name	
Comment	
MRO NSRF agrees that the applicability section and/or actual requirements should define the scope of equipment included/excluded whether it be a Category 1 GO/GOP or Category 2 GO/GOP, as Defined in the proposed NERC ROP.	
Likes 1	Lincoln Electric System, 5, Millard Brittany
Dislikes 0	

Response	
Thank you for the comment, the DT will take this into consideration.	
Christine Kane - WEC Energy Group, Inc. - 3, Group Name WEC Energy Group	
Answer	
Document Name	
Comment	
WEC Energy Group supports the comments of the MRO NSRF.	
Likes 0	
Dislikes 0	
Response	
Thank you for the comment, please refer to the response to MRO NSRF's comment.	
Dennis Chastain - Tennessee Valley Authority - 1,3,5,6 - SERC	
Answer	
Document Name	
Comment	
The IBR definition states that they have a common point of interconnection. As such, it doesn't need to be stated again so 4.1 could state: **4.1 Facilities:** (1) BES Inverter-Based Resources; and (2) Non-BES Inverter Based Resources (IBRs) that either have or contribute to an aggregate nameplate capacity of greater than or equal to 20 MVA, connected through a system designed primarily for delivering such capacity at a voltage greater than or equal to 60 kV.	
Likes 0	
Dislikes 0	
Response	

Thank you for the suggestion, the DT will take this back for consideration.	
Colby Galloway - Southern Company - Southern Company Services, Inc. - 1,3,5,6 - SERC, Group Name Southern Company	
Answer	
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Thank you for the comment.	
Steven Rueckert - Western Electricity Coordinating Council - 10, Group Name WECC Entity Monitoring	
Answer	
Document Name	
Comment	
It appears that there was not a question above that can be answered Yes or NO, so WECC did not respond. However we do have the folloing thoughts. Note- ALL SDTs needs to be clear in the usage of proposed terms- In the example question, the phrases “IBR unit” and “applicable units” are used. As esoteric as that is, the question clearly demonstrates that the current and future SDTs using the terms should do so carefully and deliberately. Defined terms are critical and using additional descriptors (especially the same term) can lead to various interpretations/thoughts by all entities. Is there any reason why “IBR” is not shown after item 1 phrase? Is there a distinction trying to be made by use or non-use of the hyphen in IBR terms within item 1 and 2? The use of “connection” versus “interconnection”	
Likes 0	
Dislikes 0	

Response	
Thank you for the comment, the team will review the usage of these terms for the future posting. Thank you for the comment and insight, these comments will be passed along, and necessary changes will be considered and made.	
Mark Gray - Edison Electric Institute - NA - Not Applicable - NA - Not Applicable	
Answer	
Document Name	
Comment	
EEI has no suggested modifications regarding the readability of the example applicability language.	
Likes 0	
Dislikes 0	
Response	
Thank you for the comment.	
Charles Yeung - Southwest Power Pool, Inc. (RTO) - 2 - MRO,WECC, Group Name SRC 2023	
Answer	
Document Name	
Comment	
Paragraph 2 in the posted technical rationale is clear enough without this example. At this point, adding an example may just cause more confusion becuase the approach for expanding the registration to include these (currently non-BES) facilities has not been finalized. The example may make sense if NERC continues with its current approach of expanding GO/GOP registration criteria, but if NERC were to return to the originally proposed approach of creating new registration categories the specification of facilities in this example would be redundant.	
Likes 0	
Dislikes 0	

Response	
Thank you for the comment and clarifications for the next ballot.	
Jodirah Green - ACES Power Marketing - 1,3,4,5,6 - MRO,WECC,Texas RE,SERC,RF, Group Name ACES Collaborators	
Answer	
Document Name	
Comment	
We recommend modifying Section 4.1 Functional Entities to specifically reference the new Category 1 GO/GOP and Category 2 GO/GOP definitions.	
Likes 0	
Dislikes 0	
Response	
Thank you for the comment and insight, these comments will be passed along, and necessary changes will be considered and made.	
Kennedy Meier - Electric Reliability Council of Texas, Inc. - 2	
Answer	
Document Name	
Comment	
ERCOT joins the comments submitted by the ISO/RTO Council (IRC) Standards Review Committee (SRC) for this response and adopts them as its own.	
Likes 0	
Dislikes 0	
Response	
Thank you for the comment, please refer to the response to the IRC SRC's comment.	
Amy Wilke - American Transmission Company, LLC - 1	

Answer	
Document Name	
Comment	
No comments.	
Likes 0	
Dislikes 0	
Response	
Thank you for the comment.	

4. *Provide any additional comments for the DT to consider, if desired*.	
Amy Wilke - American Transmission Company, LLC - 1	
Answer	
Document Name	
Comment	
The standard should operate as a stand-alone document. The standard should address the who, what, when, where and sometimes how (not always). The Tech Rationale is only "why" a requirement is in the standard. References to the Tech Rationale can be misleading in that it is not part of the standard.	
Likes 0	
Dislikes 0	
Response	
Thank you for the comment and this interpretation. The technical rationale was attempting to provide an explanation for the choices and decision the DT made to lead to the balloted version.	
Kennedy Meier - Electric Reliability Council of Texas, Inc. - 2	
Answer	
Document Name	
Comment	
ERCOT joins the comments submitted by the IRC SRC for this response and adopts them as its own.	
Likes 0	
Dislikes 0	
Response	

Thank you for the comment, please see the response to IRC SRC comment.	
Joshua Phillips - Southwest Power Pool, Inc. (RTO) - 2	
Answer	
Document Name	
Comment	
If determined that load should be included, SPP recommends the Standard Drafting Team consider concurrently undertaking the necessary process to have the SAR(s) revised to allow for more broadly applicable Glossary of Terms definitions while continuing to develop this definition.	
Likes 0	
Dislikes 0	
Response	
Thank you for the comment.	
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	
Thank you for the comment.	
Charles Yeung - Southwest Power Pool, Inc. (RTO) - 2 - MRO,WECC, Group Name SRC 2023	
Answer	

Document Name	
Comment	
1. Line 89 in the Technical Rationale currently states: “Unit if they end up with their own definition).” The SRC recommends that line 89 be changed to: “Unit definitions:” 2. The SRC does not believe Inclusion of the statement “IBRs include, but are not limited to, solar photovoltaic (PV), Type 3 and Type 4 wind, battery energy storage system (BESS), and fuel cell” in the IBR definition is necessary and therefore recommends that it be deleted. If the SDT determines there is a benefit to keeping this list of examples, the SRC suggests that the list be changed to read: “IBRs include, but are not limited to, solar photovoltaic (PV) Facilities, Type 3 and Type 4 wind Facilities, battery energy storage system (BESS) Facilities, and fuel cell Facilities.” Listing only “solar photovoltaic (PV)” is somewhat ambiguous, as it could be understood refer to just the PV panel or to an IBR Unit (which may or may not be an IBR according to the proposed definition).	
Likes 0	
Dislikes 0	
Response	
Thank you for the comments, and the first recommendation. To answer the second comment, thank you for the insight the DT has adjusted the wording in the definition to better reflect the inclusive change.	
Steven Rueckert - Western Electricity Coordinating Council - 10, Group Name WECC Entity Monitoring	
Answer	
Document Name	
Comment	
WECC appreciates the efforts of the SDT to ensure clarity in the definitions and use of the definitions moving forward to help ensure reliable planning and operation of the BPS.	
Likes 0	
Dislikes 0	
Response	

Thank you for support and the response.	
Wayne Sipperly - North American Generator Forum - 5 - MRO,WECC,Texas RE,NPCC,SERC,RF	
Answer	
Document Name	
Comment	

The NAGF provides the following additional comments for consideration:

a. The NAGF is concerned with the use of the term "unit" in the proposed IBR Unit definition as it seems to conflict with the way industry currently uses the term. Recommend that Drafting Team consider replacing with the term with "element" or "device" in the event the Drafting Team continues to support the need for two definitions.

b. The NAGF recommends that the proposed IBR Unit definition be revised as follows:

"An individual device or a grouping of multiple devices, that uses a power electronic interface, such as an inverter or converter, capable of exporting Real Power from a primary energy source or energy storage system, and that connects at a single point on the collector system."

c. Technical Rationale – the document currently references the terms "IBR", "IBR Unit", and "IBR plant/facility". Recommend that the document references align with the IBR Glossary of Terms definitions to eliminate possible confusion.

d. The NAGF notes that there are two SARs that form the basis for this project:

i. Modifications to MOD-026 and MOD-027

ii. Applicability revisions for transmission connected dynamic reactive resources

The scope of these SARs does not appear to provide the SDT with the latitude to modify the NERC Glossary of Terms for IBRs. The MOD-026/027 SAR does not have the box checked for "Add, Modify or Retire a Glossary Term". While the transmission connected dynamic reactive resources SAR does have such box selected, it limits such changes to "also define new Glossary Terms for TCDRR or related terms". Therefore, the NAGF requests that the Drafting Team revisit the SARs accordingly to ensure that the Drafting Team is not overstepping their intended scope.

Likes 0	

Dislikes 0	
Response	
Thank you for the comment, the DT has removed the IBR Unit in this posting. The two standards referenced are upcoming projects that will be revised under milestone 3 under the FERC order, and the team is going to consider not overstepping going forward with IBR in these standards.	
Mark Garza - FirstEnergy - FirstEnergy Corporation - 4, Group Name FE Voter	
Answer	
Document Name	
Comment	
FirstEnergy requests as the drafting team moves forward with this endeavor that they ensure the applicability is maintained across all standards that relate to this topic.	
Likes 0	
Dislikes 0	
Response	
Thank you for the support.	
Dwanique Spiller - Berkshire Hathaway - NV Energy - 5	
Answer	
Document Name	
Comment	
Upon review of the SARs under which this Standard Drafting Team is operating, NV Energy is of the opinion that the creation of a new glossary of terms definition such as “Inverter Based Resource” is not currently within scope for the Standard Drafting Team. NV Energy would suggest that the Standard Drafting Team concurrently undertake the necessary process to have the SAR(s) revised to allow for the creation of broadly applicable Glossary of Terms definitions, while also continuing to develop this definition to allow for further	

improvements to the reliability of the Bulk Power System while adhering to the rules for standard development as prescribed by the Standard Processes Manual.	
Likes 0	
Dislikes 0	
Response	
Thank you for the comment, the ask of the creation of the creation of an IBR definition was reaffirmed in scope for the DT, thank you for the comment.	
Ruida Shu - Northeast Power Coordinating Council - 1,2,3,4,5,6,7,8,9,10 - NPCC, Group Name NPCC RSC	
Answer	
Document Name	
Comment	
NPCC RSC supports the IBR and IBR unit definition.	
Likes 0	
Dislikes 0	
Response	
Thank you for the support.	
Colby Galloway - Southern Company - Southern Company Services, Inc. - 1,3,5,6 - SERC, Group Name Southern Company	
Answer	
Document Name	
Comment	
First, there are concerns with the use of "Unit" in the **IBR Unit** definition due to the current and historical use of the term "Unit" with respect to generating plants. Often, that term has been and is used to represent the entire facility, not specifically the AC power	

producing component. Consider changing "IBR Unit" to "IBR Device" to resolve this concern and confusion. Note this possible confusion even exists within the Comment item #3 above where the difference between Unit and unit is very significant. Second, the SDT should consider the compatibility of the proposed IBR definition, as depicted in Figure 2.1 of the Technical Rational with the existing BES definition, I4 inclusion. The definition does not include the collection system (below 75MVA) in the scope of the parts of a facility.	
Likes 0	
Dislikes 0	
Response	
Thank you for the comment, the DT has taken this into consideration with the next round of posting of the IBR definition, the DT has excluded IBR Unit language from the definition and did not repost IBR Unit for another ballot. Second comment, thank you for the comment this will be passed along to the DT for consideration.	
Marty Hostler - Northern California Power Agency - 4	
Answer	
Document Name	
Comment	
None.	
Likes 0	
Dislikes 0	
Response	
Thanks for the comment.	
Megan Melham - Decatur Energy Center LLC - 5	
Answer	
Document Name	
Comment	

Capital Power supports the NAGF comments as below:

The NAGF provides the following additional comments for consideration:

a. The NAGF is concerned with the use of the term “unit” in the proposed IBR Unit definition as it seems to conflict with the way industry currently uses the term. Recommend that Drafting Team consider replacing with the term with “element” or “device” in the event the Drafting Team continues to support the need for two definitions.

b. The NAGF recommends that the proposed IBR Unit definition be revised as follows:

“An individual device or a grouping of multiple devices, that uses a power electronic interface, such as an inverter or converter, capable of exporting Real Power from a primary energy source or energy storage system, and that connects at a single point on the collector system.”

c. Technical Rationale – the document currently references the terms “IBR”, “IBR Unit”, and “IBR plant/facility”. Recommend that the document references align with the IBR Glossary of Terms definitions to eliminate possible confusion.

d. The NAGF notes that there are two SARs that form the basis for this project:

i. Modifications to MOD-026 and MOD-027

ii. Applicability revisions for transmission connected dynamic reactive resources

The scope of these SARs does not appear to provide the SDT with the latitude to modify the NERC Glossary of Terms for IBRs. The MOD-026/027 SAR does not have the box checked for “Add, Modify or Retire a Glossary Term”. While the transmission connected dynamic reactive resources SAR does have such box selected, it limits such changes to “also define new Glossary Terms for TCDRR or related terms”. Therefore, the NAGF requests that the Drafting Team revisit the SARs accordingly to ensure that the Drafting Team is not overstepping their intended scope.

Likes 0	
Dislikes 0	

Response

Please refer to the response to NAGF’s comment.

Donna Wood - Tri-State G and T Association, Inc. - 1	
Answer	
Document Name	
Comment	
NA	
Likes 0	
Dislikes 0	
Response	
Thank you for the comment.	
Dennis Chastain - Tennessee Valley Authority - 1,3,5,6 - SERC	
Answer	
Document Name	
Comment	
There is a need to ensure the IBR definition is sufficiently clear to determine if pumped storage facilities (particularly new variable speed pumped storage technologies that act similar to IBRs) might be considered as an applicable generator, so that when applying standards and requirements to these facilities, it is clear as to which applies. Does every plant need to be classified as a synchronous generator or an IBR? If so, pumped storage facilities, for example, could be considered to act like bulk energy system synchronous machines due to charging and discharging modes, while at the same time ride-thru capabilities may not seamlessly apply.	
Likes 0	
Dislikes 0	
Response	
Thank you for the suggestion, this will be passed along to the DT. The DT did decide when drafting to not include an exhaustive list of types of IBRs.	

Christine Kane - WEC Energy Group, Inc. - 3, Group Name WEC Energy Group	
Answer	
Document Name	
Comment	
WEC Energy Group supports the comments of the MRO NSRF.	
Likes 0	
Dislikes 0	
Response	
Thank you for the response, please see the response to MRO NSRF's comment.	
Andy Thomas - Duke Energy - 1,3,5,6 - SERC,RF	
Answer	
Document Name	
Comment	
None.	
Likes 0	
Dislikes 0	
Response	
Thank you for the support.	
Srikanth Chennupati - Entergy - Entergy Services, Inc. - 1,3,5,6 - SERC	
Answer	
Document Name	
Comment	

none	
Likes 0	
Dislikes 0	
Response	
Thank you for the comment.	
Anna Martinson - MRO - 1,2,3,4,5,6 - MRO, Group Name MRO Group	
Answer	
Document Name	Project 2020-06 MRO NSRF IBR Definition 20240403 Final.docx
Comment	
Upon review of the SARs under which this Standard Drafting Team is operating, MRO NSRF is of the opinion that the creation of a new glossary of terms definition such as “Inverter Based Resource” is not currently within scope for the Standard Drafting Team. MRO NSRF would suggest that the Standard Drafting Team concurrently undertake the necessary process to have the SAR(s) revised to allow for the creation of broadly applicable Glossary of Terms definitions, while also continuing to develop this definition to allow for further improvements to the reliability of the Bulk Power System while adhering to the rules for standard development as prescribed by the Standard Processes Manual. See attachment!	
Likes 0	
Dislikes 0	
Response	
Thank you for the comment, the team is able to draft a definition under the scope of this project along with the newly added Milestone 3 SAR. To answer the second question, this suggestion will be passed along for consideration.	
Israel Perez - Israel Perez On Behalf of: Mathew Weber, Salt River Project, 3, 1, 6, 5; Sarah Blankenship, Salt River Project, 3, 1, 6, 5; Thomas Johnson, Salt River Project, 3, 1, 6, 5; Timothy Singh, Salt River Project, 3, 1, 6, 5; - Israel Perez	
Answer	

Document Name	
Comment	
SRP does not support the addition or modification 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	
Thank you for the comment, this will be passed along.	
Jennifer Bray - Arizona Electric Power Cooperative, Inc. - 1	
Answer	
Document Name	
Comment	
Thank you for the opportunity to comment.	
Likes 0	
Dislikes 0	
Response	
Thank you for the support.	
Daniela Atanasovski - APS - Arizona Public Service Co. - 1	
Answer	
Document Name	
Comment	

None	
Likes 0	
Dislikes 0	
Response	
Thank you for the support.	
Rachel Schuldt - Black Hills Corporation - 6, Group Name Black Hills Corporation - All Segments	
Answer	
Document Name	
Comment	
Black Hills Corporation agrees with comments provided by NAGF, EEI and other industry peer groups.	
Likes 0	
Dislikes 0	
Response	
Thank you, please refer to the response to each of the respected group's comments.	
Michael Johnson - Michael Johnson On Behalf of: Marco Rios, Pacific Gas and Electric Company, 3, 1, 5; Sandra Ellis, Pacific Gas and Electric Company, 3, 1, 5; Tyler Brun, Pacific Gas and Electric Company, 3, 1, 5; - Michael Johnson, Group Name PG&E All Segments	
Answer	
Document Name	
Comment	
PG&E has no further comments for the DT, but does wish to thank the DT for listening to the industry in making the current modifications in a difficult and contentious process.	
Likes 0	

Dislikes 0	
Response	
Thank you for the support.	
Teresa Krabe - Lower Colorado River Authority - 5	
Answer	
Document Name	
Comment	
None.	
Likes 0	
Dislikes 0	
Response	
Thank you for the support.	
Kristina Marriott - Miller Bros. Solar, LLC - 5 - MRO,WECC,Texas RE	
Answer	
Document Name	
Comment	
Great Job, this is not an easy task!	
Likes 0	
Dislikes 0	
Response	
Thank you for the support.	

End of Report