# Comment Report

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| **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 Ballots: | 2020-06 Verifications of Models and Data for Generators IBR Unit AB 2 DEF<br>2020-06 Verifications of Models and Data for Generators IBR-related Definitions \| Implementation Plan AB 2 OT<br>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.

**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.**

| 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 |
| | | | | | 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 |

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|---|---|---|---|---|---|---|---|---|
| | | | | | 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 |
| | | | | | 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 |
| 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 | 6 | SERC |

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|---|---|---|---|---|---|---|---|---|
| | | | | | | Company - Southern Company Generation | | |
| | | | | | 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 |
| | | | | | 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 |
| | | | | | Stacey Sheehan | FirstEnergy - FirstEnergy Corporation | 6 | RF |
| Michael | Michael | | WECC | PG&E All | Marco Rios | Pacific Gas | 1 | WECC |

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|---|---|---|---|---|---|---|---|---|
| Johnson | Johnson | | | Segments | | and Electric Company | | |
| | | | | | 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 |
| | | | | | 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 | 2 | NPCC |

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| | Operator | | |
| Randy MacDonald | New Brunswick Power Corporation | 2 | NPCC |
| 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 |
| 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 |

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|---|---|---|---|---|---|---|---|---|
| | | | | | 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 |
| 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 |
| | | | | | 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 | 1 | WECC |

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| | | | | | | California | | |

**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**

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| **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.*

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| Likes 0 | |
| Dislikes 0 | |

**Response**

**Sean Bodkin - Dominion - Dominion Resources, Inc. - 6, Group Name** Dominion

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| **Answer** | No |
| **Document Name** | |

**Comment**

Dominion Energy does not agree with the proposed efintion and offers the folloowing 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).

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| Likes 0 | |
| Dislikes 0 | |

**Response**

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

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|---|---|
| **Answer** | No |

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| **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.

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| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **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."*

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| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **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.

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| Likes 0 | |
| Dislikes 0 | |

**Response**

**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**

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| **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.

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| Likes 0 | |
| Dislikes 0 | |

**Response**

**Srikanth Chennupati - Entergy - Entergy Services, Inc. - 1,3,5,6 - SERC**

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| **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."

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| Likes 0 | |
| Dislikes 0 | |

**Response**

**Anna Martinson - MRO - 1,2,3,4,5,6 - MRO, Group Name** MRO Group

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|---|---|
| **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.

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

**Response**

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

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| **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.

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| Likes 0 | |
| Dislikes 0 | |

**Response**

**Christine Kane - WEC Energy Group, Inc. - 3, Group Name** WEC Energy Group

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|---|---|
| **Answer** | No |
| **Document Name** | |

| Comment | |
|---|---|
| WEC Energy Group supports the comments of the MRO NSRF. | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **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:<br><br>"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** | |
| | |
| **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** | |
| | |
| **Carver Powers - Utility Services, Inc. - 4** | |
| **Answer** | No |

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|---|---|
| **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.”

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| Likes 0 | |
| Dislikes 0 | |

**Response**

**Megan Melham - Decatur Energy Center LLC - 5**

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|---|---|
| **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.”

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| Likes 0 | |
| Dislikes 0 | |

**Response**

**Dwanique Spiller - Berkshire Hathaway - NV Energy - 5**

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|---|---|
| **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.

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| Likes 0 | |
| Dislikes 0 | |

**Response**

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

| | |
|---|---|
| **Answer** | No |
| **Document Name** | |

**Comment**

The NAGF 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."*

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|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

**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**

**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.

| | |
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| Likes 0 | |
| Dislikes 0 | |

**Response**

**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.

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| Likes 0 | |
| Dislikes 0 | |

**Response**

**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**

**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** | |
| | |
| **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** | |
| | |
| **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.<br><br>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:<br><br>**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.<br><br>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.<br><br>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.

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| Likes 0 | |
| Dislikes 0 | |

**Response**

**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

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|---|---|
| **Answer** | Yes |
| **Document Name** | |

**Comment**

PG&E supports the IBR definition.

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|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

**Daniela Atanasovski - APS - Arizona Public Service Co. - 1**

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|---|---|
| **Answer** | Yes |
| **Document Name** | |

**Comment**

None

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

**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** | |
| | |
| **Mark Garza - FirstEnergy - FirstEnergy Corporation - 4, Group Name** FE Voter | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| None. | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **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 |
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| |
| **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** |
| |
| **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.<br><br>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** |
| |
| **Thomas Foltz - AEP - 5** |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** |
| |
| Likes 0 | |
| Dislikes 0 | |

| Response | |
|---|---|
| | |
| **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 | |
|---|---|
| | |
| **Mohamad Elhusseini - DTE Energy - Detroit Edison Company - 3,5** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |

| Response | |
|---|---|
| | |
| **Casey Perry - PNM Resources - 1,3 - WECC,Texas RE** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |

| Response | |
|---|---|
| | |
| **Cain Braveheart - Bonneville Power Administration - 1,3,5,6 - WECC** | |
| **Answer** | Yes |
| **Document Name** | |

| | |
|---|---|
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Dave Krueger - SERC Reliability Corporation - 10** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **David Jendras Sr - Ameren - Ameren Services - 3** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **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** | |

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|---|---|
| | |
| **Junji Yamaguchi - Hydro-Quebec (HQ) - 5** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **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** | |
| | |
| **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** | |
| | |
| **Diana Aguas - CenterPoint Energy Houston Electric, LLC - 1 - Texas RE** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |

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|---|---|
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Leslie Hamby - Southern Indiana Gas and Electric Co. - 3,5,6 - RF** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Kinte Whitehead - Exelon - 1,3** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Mike Magruder - Avista - Avista Corporation - 1** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |

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|---|---|
| **Charles Yeung - Southwest Power Pool, Inc. (RTO) - 2 - MRO,WECC, Group Name** SRC 2023 | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Kennedy Meier - Electric Reliability Council of Texas, Inc. - 2** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **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** | |
| | |
| **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** | |
| | |

**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."

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| Likes 0 | |
| Dislikes 0 | |

**Response**

**Amy Wilke - American Transmission Company, LLC - 1**

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|---|---|
| **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** | |
| | |
| **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.<br><br>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** | |
| | |
| **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.<br><br>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.<br><br>Therefore, it is our recommendation that the IBR Unit definition be modified as follows:<br><br>**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 | |

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|---|---|
| Dislikes 0 | |

| **Response** |
|---|
| |

| **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** |
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| |

| **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** |
|---|
| |

| **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. | |

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| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Dwanique Spiller - Berkshire Hathaway - NV Energy - 5** | |
| **Answer** | No |
| **Document Name** | |
| **Comment** | |
| See Question 1. | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **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."

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| Likes 0 | |
| Dislikes 0 | |

**Response**

**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.

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|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

**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."

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| Likes 0 | |
| Dislikes 0 | |

| Response | |
|---|---|
| | |
| **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** | |
| | |
| **Andy Thomas - Duke Energy - 1,3,5,6 - SERC,RF** | |
| **Answer** | No |
| **Document Name** | |
| **Comment** | |
| See Question #1 Response. | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **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 | |
|---|---|
| | |
| **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** | |
| | |
| **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** | |
| | |
| **Jennifer Bray - Arizona Electric Power Cooperative, Inc. - 1** | |
| **Answer** | No |
| **Document Name** | |
| **Comment** | |
| AEPC has signed on to ACES comments:<br><br>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**

**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**

**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**

**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 |
| --- |
| |
| **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.<br><br>**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** |
| |
| **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** |
| |
| **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** | |
| | |
| **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** | |
| | |
| **Mark Garza - FirstEnergy - FirstEnergy Corporation - 4, Group Name** FE Voter | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| No comment. | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **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 |
| --- |
| |
| **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** |
| |
| **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** |
| |
| **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** | |
| | |
| **Daniela Atanasovski - APS - Arizona Public Service Co. - 1** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| None | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **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** | |
| | |
| **Kennedy Meier - Electric Reliability Council of Texas, Inc. - 2** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |

| | |
|---|---|
| Dislikes 0 | |
| **Response** | |
| | |
| **Charles Yeung - Southwest Power Pool, Inc. (RTO) - 2 - MRO,WECC, Group Name** SRC 2023 | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Mike Magruder - Avista - Avista Corporation - 1** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Kinte Whitehead - Exelon - 1,3** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Diana Aguas - CenterPoint Energy Houston Electric, LLC - 1 - Texas RE** | |
| **Answer** | Yes |

| | |
|---|---|
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **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** | |
| | |
| **David Jendras Sr - Ameren - Ameren Services - 3** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Cain Braveheart - Bonneville Power Administration - 1,3,5,6 - WECC** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |

| Response | |
|---|---|
| | |
| **Casey Perry - PNM Resources - 1,3 - WECC,Texas RE** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Matt Lewis - Lower Colorado River Authority - 1,5** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Teresa Krabe - Lower Colorado River Authority - 5** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Mohamad Elhusseini - DTE Energy - Detroit Edison Company - 3,5** | |
| **Answer** | Yes |
| **Document Name** | |

| Comment | |
|---|---|
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **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** | |
| | |
| **Duane Franke - Manitoba Hydro - 1,3,5,6 - MRO** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Thomas Foltz - AEP - 5** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |

| | |
|---|---|
| | |
| **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** | |
| | |
| **Megan Melham - Decatur Energy Center LLC - 5** | |
| **Answer** | |
| **Document Name** | |
| **Comment** | |
| Capital Power supports the NAGF comments for the IBR Unit definition as below:<br><br>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** | |
| | |

**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 defintoin.

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

**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**

| | |
|---|---|
| **Srikanth Chennupati - Entergy - Entergy Services, Inc. - 1,3,5,6 - SERC** | |
| **Answer** | No |
| **Document Name** | |
| **Comment** | |
| None | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **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.<br><br>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** | |
| | |
| **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** | |

| | |
|---|---|
| | |
| **Megan Melham - Decatur Energy Center LLC - 5** | |
| **Answer** | No |
| **Document Name** | |
| **Comment** | |
| Capital Power supports the NAGF comments as below:<br><br>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** | |
| | |
| **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** | |
| | |
| **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** | |

| | |
|---|---|
| **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** | |
| | |
| **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.<br><br>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.<br><br>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** | |
| | |
| **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**

**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**

**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**

**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**

**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**

**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** | |
| | |
| **Mark Garza - FirstEnergy - FirstEnergy Corporation - 4, Group Name** FE Voter | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| No Comments. | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **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** | |
| | |
| **Mohamad Elhusseini - DTE Energy - Detroit Edison Company - 3,5** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |

| | |
|---|---|
| | |
| **Kristina Marriott - Miller Bros. Solar, LLC - 5 - MRO,WECC,Texas RE** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Teresa Krabe - Lower Colorado River Authority - 5** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Casey Perry - PNM Resources - 1,3 - WECC,Texas RE** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Dave Krueger - SERC Reliability Corporation - 10** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

**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**

**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.

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| Likes 0 | |
| Dislikes 0 | |

**Response**

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| **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** | |
| | |
| **Daniela Atanasovski - APS - Arizona Public Service Co. - 1** | |
| **Answer** | |
| **Document Name** | |
| **Comment** | |
| None | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Jennifer Bray - Arizona Electric Power Cooperative, Inc. - 1** | |
| **Answer** | |
| **Document Name** | |
| **Comment** | |
| AEPC has signed on to ACES comments:<br><br>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** | |

| | |
|---|---|
| | |
| **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** | |
| | |
| **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** | |
| | |
| **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:<br><br>**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 |
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| |
| **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** |
| |
| **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.<br><br>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** |
| |
| **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** | |
| | |
| **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** | |
| | |
| **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** | |
| | |
| **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** | |
| | |
| **Amy Wilke - American Transmission Company, LLC - 1** | |
| **Answer** | |
| **Document Name** | |
| **Comment** | |
| No comments. | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |

**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-a-lone 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.

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| Likes 0 | |
| Dislikes 0 | |

**Response**

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

| | |
|---|---|
| **Answer** | |
| **Document Name** | |

**Comment**

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

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|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

**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.

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| Likes 0 | |
| Dislikes 0 | |

| Response |
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**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. |

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| --- | --- |
| Likes 0 | |
| Dislikes 0 | |

| Response |
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| |

**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:”<br><br>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). |

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| Likes 0 | |
| Dislikes 0 | |

| Response |
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**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 |

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|---|---|
| and operation of the BPS. | |
| Likes 0 | |
| Dislikes 0 | |
| **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.*

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|---|---|
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **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. |

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| Likes 0 | |
| Dislikes 0 | |

| Response |
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**Dwanique Spiller - Berkshire Hathaway - NV Energy - 5**

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| --- | --- |
| **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. |

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| Likes 0 | |
| Dislikes 0 | |

| Response |
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| |

**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. |

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| Likes 0 | |
| Dislikes 0 | |

| Response |
| --- |
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**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.

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| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
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| **Marty Hostler - Northern California Power Agency - 4** | |
| **Answer** | |
| **Document Name** | |
| **Comment** | |

None.

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|---|---|
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |

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|---|---|
| **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.

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| Likes 0 | |
| Dislikes 0 | |

**Response**

**Donna Wood - Tri-State G and T Association, Inc. - 1**

| | |
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| **Answer** | |
| **Document Name** | |

**Comment**

NA

| | |
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| Likes 0 | |
| Dislikes 0 | |

**Response**

**Dennis Chastain - Tennessee Valley Authority - 1,3,5,6 - SERC**

| | |
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| **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

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| same time ride-thru capabilities may not seamlessly apply. | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **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** | |
| | |
| **Andy Thomas - Duke Energy - 1,3,5,6 - SERC,RF** | |
| **Answer** | |
| **Document Name** | |
| **Comment** | |
| None. | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Srikanth Chennupati - Entergy - Entergy Services, Inc. - 1,3,5,6 - SERC** | |
| **Answer** | |
| **Document Name** | |
| **Comment** | |
| none | |
| Likes 0 | |

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| Dislikes 0 | |
| **Response** | |
| | |
| **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.<br><br>See attachment! | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **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** | |
| | |
| **Jennifer Bray - Arizona Electric Power Cooperative, Inc. - 1** | |
| **Answer** | |
| **Document Name** | |
| **Comment** | |

| |
|---|
| Thank you for the opportunity to comment. |

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| Likes 0 | |
| Dislikes 0 | |

**Response**

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| |

**Daniela Atanasovski - APS - Arizona Public Service Co. - 1**

| | |
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| **Answer** | |
| **Document Name** | |

**Comment**

| |
|---|
| None |

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

| |
|---|
| |

**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. |

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| Likes 0 | |
| Dislikes 0 | |

**Response**

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| |

**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

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| **Answer** | |
| **Document Name** | |

**Comment**

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| 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 |

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| and contentious process. | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Teresa Krabe - Lower Colorado River Authority - 5** | |
| **Answer** | |
| **Document Name** | |
| **Comment** | |
| None. | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **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** | |
| | |