

PREP WORK for July 20th TSG (will also support Aug. 3rd TSG)

Subgroup members review agenda and provide the following to staff by 7/9/18.

- 1) Propose edits to the Regulated Utilities' TIIR Draft Proposal and/or flag topics for discussion. Send as red-lines and comments using track changes to the 6-8-18 Draft TIIR.**
 - a. Definitions in Section 3B for Energy Storage System, Inadvertent Export, Nameplate Ratings, Non-export
 - b. Energy Storage; Section 10
 - c. Non-Exporting and Inadvertent Export; Section 11
 - d. Capacity (Potential future home in definition section of TIIR: Section 3B) (See [MN DIP 5.14.3 in Updated Staff Recommendations attached to 5/16/18 briefing papers](#), p. 18-23; MN DIP 5.14.3)
- 2) Review and be prepared to reference IEEE 1547-2018**
 - a. Definitions in Clause 3.1
 - i. Nameplate Ratings
 - ii. Point of Common Coupling (PCC)
 - iii. Point of DER Connection (PoC)
 - iv. Reference Point of Applicability (RPA)
 - b. Capacity as related to Reference Point of Applicability; Clauses 4.1 and 4.2
 - c. Capability to limit active power; Clause 4.6.2
 - d. Energy Storage
 - i. Performance during Entering Service; Clause 4.10.3
 - ii. Specifications regarding voltage-active power mode; Clause 5.4.2
 - iii. Frequency ride-through exception; Clause 6.5.2.1
 - iv. Frequency-droop operation; in footnote to Table 23 of Clause 6.5.2.7.2
 - v. Guidelines for DER performance category assignment in Annex B; B.4.1 and Table B.1
 - vi. DER intentional and microgrid island system configurations in Annex C; C.2
 - e. Concept of net export ("net active power exported") is covered within
 - i. Voltage ride-through exceptions; Clause 6.4.2.1
 - ii. Frequency ride-through exceptions; Clauses 6.5.2.1 and 6.5.2.3
 - f. Non-Exporting and Inadvertent Export; Clauses 4.9 and 8.2
- 3) Please provide input to the below, slides are encouraged**
 - a. During the DGWG work group and the TSG process, different proposals have been made as to the definition of capacity.
 - i. How could we define capacity in a way that keeps the MN TIIR as consistent as possible with IEEE 1547-2018, the MN DIP and the MN DIA?
 - ii. What are the edge cases that would have a negative impact based on the proposals you've had the most concerns about?

1. Could those edge cases be mitigated by clarifications elsewhere?
 - b. Considering different types of limits ...such as control systems, power relay(s), or other similar device settings or adjustments (MN DIP 5.14.3); what types of limits can be easily (inadvertently or purposefully) changed after initial system interconnection?
 - i. What level of impact could this have on equipment?
 - ii. What level of impact could this have on people?
 - iii. Are there changes in technology expected that would make this use case look significantly different?
 - c. What are the specific analyses within a system impact study that require full DER capacity (e.g. short circuit analysis,)?
 - d. Provide similarities and differences with regards to the impact on the Area EPS of energy storage compared to a traditional load.
 - e. Provide similarities and differences with regards to the impact on the Area EPS of energy storage compared to other distributed generation.
- 4) Electrical Engineering for the rest of us...(an additional request for slides)**
- a. Please provide a diagram(s) in which the following can be illustrated
 - i. A non-exporting system influencing voltage levels within the Area EPS
 - ii. A non-exporting system influencing the thermal performance within the Area EPS
 - iii. A component of a non-exporting system protecting the Area EPS from fault current
 - iv. An inverter from a non-exporting system contributing to fault current

-----End Of Prep Work -----

Technical Subgroup Meeting 4 DRAFT AGENDA

Friday, July 20th

9:30am – 12:30pm

[Join WebEx meeting](#)

Meeting number (access code): 741 336 029

Meeting password: yH5HJy39

Join from a video system or application

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Proposed Agenda

Time	Topic
9:30 – 9:40	Welcome, Introductions, Overview of Agenda, Expectations
9:40 – 9:45	Recap
9:45 – 10:10	Energy Storage, including comparing and contrasting to other load and generation
10:10 – 10:20	Case Study: Non-exporting DER influencing voltage on Area EPS
10:20 – 10:30	Case Study: Non-exporting inverter contributing to fault current
10:30 – 10:35	Case Study: Non-exporting DER providing Area EPS fault protection
10:35 – 10:45	Non-Exporting Systems
10:45 – 11:00	Discuss aspects of limiting production; high confidence systems vs. challenges 15
11:00 – 11:25	Inadvertent Export
11:25 – 11:30	Break (5 minutes)
11:30 – 11:40	System impact study assumptions that are consistent with aggregate nameplate rating
11:40 – 11:50	Unintended consequences resulting from capacity = aggregate nameplate rating
11:50 – 12:20	Capacity, including a discussion of Limits and Load
12:20 – 12:30	Meeting Evaluation & Next Steps

Phase II Technical Subgroup Roster

Craig Turner, Dakota Electric	Robert Jagusch, MMUA	Patrick Dalton/John Harlander/Alan Urban, Xcel Energy
Lise Trudeau, Dept of Commerce	Kevin McLean/Jenna Warmuth, MN Power	
Kevin Joyce/Katie Bell, EFCA	Kristi Robinson, MREA	John Dunlop/Chris Jarosch, MNSEIA
Brian Lydic/Sky Stanfield/Laura Hannah – Joint Movants	Dean Pawlowski, Otter Tail Power	Commissioner Matt Schuerger; Michelle Rosier; Cezar Panait
Professor Mahmoud Kabalan, St. Thomas Affiliation		Technical Assistance*: Michael Coddington and Michael Ingram, National Renewable Energy Laboratory Tom Key, Jens Boemer, Nadav Enbar; Electric Power Research Institute Pam Johnson, DOE Solar Energy Innovator Fellow

*Technical assistance is not a participant or party to the docket and does not advocate for specific outcomes in the proceeding. The role of technical assistance is to support Commission staff in the process for these proceedings, and to provide an objective source of information or data, as requested, by Commission staff to understand areas of disagreement amongst participants.

Draft Meeting Topics Proposal

<u>Date</u>	<u>Topic</u>
3/23/18	Meeting 1 Scope/Overview** (Walk-through with explanations: Red-lined TIIR; List of topics in scope of TSMs; Definitions
4/13/18	Meeting 2 Performance Categories**, Response to abnormal conditions; MISO Bulk Power System
5/18/18	
6/1/18	Full DGWG Meeting Technical Subgroup update; Phase I Update/Next Steps
6/8/18	Meeting 3 Reactive Power and Voltage/Power Control Performance**, Protection Requirements
7/20/18	Meeting 4 Energy Storage**, Non-Export and Inadvertent Export**, Capacity**
8/3/18	Meeting 4 topics continued
8/10/18	Meeting 5 Interoperability** (Monitor and Control Criteria); Metering**, cyber security
9/14/18	Meeting 7; Test and Verification**, Witness Test Protocol
9/21/18	Full Day, In Person TSG Meeting – Power Quality; Follow up items; Review/Reconcile edits in the draft TIIR
10/19/18	References; Definitions*; 1-line diagram requirements; Agreements*, Frequency Ride-through
11/9/18	Full DGWG Meeting 7