

NPCC Draft Guidance Document – An Approach for Distributed Energy Resources (DER) on Distribution Systems

Comments and disposition of comments

Comment Number	Comment Provider	Comment	Response	Disposition
NYISO 2	Greg Campoli	Comment on “Introduction and Objective” section Page 4: (Presently there are not study tools in general use to perform fully integrated studies of transmission and distribution which would allow both systems to be modeled and studied (in steady state and dynamically) together, although work is underway in this regard.)	Have added this thought as a current reliability risk in the introduction and objectives section.	accepted
HQ 1	Aubut Noel	This guidance document applies only to resources connected on the distribution level. We believe that there is also a need for a guide about resources located behind the meter. These resources will increase in the future and can potentially affect the behavior of the bulk electric system.	The guidance document may be evolving in that direction in the future. Some of the guidance recommendations for consideration in the guideline apply to BES connected facilities.	considered
HQ 2	Aubut Noel	The guide should expose more clearly that specific requirements that each utility may have for the connection of DER (e.g. the Grid Codes or equivalent) must be followed in priority. These can include references to standard IEEE-1547 and have additional and or more stringent requirements than what is found in this standard.	This could be an area for future work.	considered
NAGF 1	Wayne Sipperly	Comment on “Introduction and Objective” section Page 4: (Additionally, for upward ramping, the distribution level connected resource should be available and operate with the “headroom.”) a. The intent of this document is to identify risks and establish guidance for DER interconnection. This statement, while important, is not associated with interconnection but rather operation or market issues.	NPCC believes the sentence should stay. Operating without adequate headroom in a high DER penetration future is an identified risk.	Considered.
NAGF 2	Wayne Sipperly	Comment on “Introduction and Objective” section Page 4: (The intent of this document is to identify risks and establish guidance, where possible, for interconnection of DER.) a. Intent of this document identified here.	NPCC agrees	accepted
NAGF 3	Wayne Sipperly	Comment on “NPCC Reliability Principles” section Page 4: a. Not sure how this section applies to DER interconnection	NPCC believes the Reliability Principles are core to the	considered

NPCC Draft Guidance Document – An Approach for Distributed Energy Resources (DER) on Distribution Systems

Comments and disposition of comments

		or what is being said as to how NPCC Criteria may apply to DER resources.	identification of risks and the selection of topics to offer guidance on. The Principles were articulated in the 2018 NPCC Strategic Review document.	
NYISO 2	Greg Campoli	NERC appears to suggest that studies modeling a few details at the T-D interface is sufficient. Is NPCC proposing that more detailed and coordinated studies between transmission and distribution is needed?	Have added a footnote to identify this as an issue and help NPCC take a position on whether the NERC approach is adequate	accepted
ISO-NE 1	ISO-NE ¹	Recommend including in the Executive Summary and Introduction and Objective section a statement that says “The guidelines in this document are strictly voluntary and are designed to assist in reviewing, revising, or developing individual entity practices to support reliability. Furthermore, the guidelines are not intended to take precedence over Reliability Standards, regional procedures, or regional requirements.”	Made editorial changes to the opening section that make clear this document provides voluntary guidance.	accepted
CMP 1 Transmission	Keith Radonis	The document needs more details regarding the “risks” or the justification why certain requirements were proposed for NPCC. Currently, the document has very limited information regarding the risks but focuses more on the requirements.	Some risks have been called out in this version. E.g. restoration, observability. But agree that more could be done in terms of identifying risks.	accepted
CMP 2 Transmission	Keith Radonis	Without the information about the risks, it is hard to understand why certain requirements were recommended? In particular, it looks like this document recommends the requirements that came from a portion of IEEE-1547-2018 plus something new such as grounding issues.	The areas selected were generally based on what certain NPCC Members have felt they needed to address to deal with power system impact risks to effectively and proactively deal with penetration of DER on their respective systems.	considered
CMP 3 Transmission	Keith Radonis	Several requirements imply the operation of these DERs may require robust communication and intensive coordination among the owners or with the centralized entities. It may be a good idea that this document also discuss this issue.	SCADA section was added as one example of a topic needed.	accepted
CMP 4	Keith	CMP is highly supportive of the concept that NPCC will work with other	Thank you for your comment. There	accepted

¹ From the documents I received it was not always possible to identify the specific person commenting for the ISO-NE.

NPCC Draft Guidance Document – An Approach for Distributed Energy Resources (DER) on Distribution Systems

Comments and disposition of comments

Transmission	Radonis	responsible entities and develop an NPCC-Wide interconnection requirements. We hope this effort will result in less duplications and more streamline interconnection processes.	will be future versions of the guidance document to improve it as learning and experience is accumulated.	
Hydro One 1	Jason Bonaface	Remote control of dispatching DERs. This is not meant to infer a schedule process; however as part of our development in this process at Hydro One, the Control Centre has no direct means to remove a DER from service remotely while keeping the supply feeder in service. This process is facilitated through a customer connection agreement and requires communication with the DER operator. The significant challenge we have found as a result of this is the Operators can be anywhere in the world at this time and that certainly can lead to significant delays.	Used Remote operators as a footnoted example in the introduction of a reliability risk identified but not addressed at this time in this document.	accepted
Hydro One 2	Jason Bonaface	Communication Issues. The control center has interacted with entities all over the world when needing assistance with DER Operators. A specific example was a Control Centre from Germany and fortunately had a German speaking employee to help at the time. I am not sure these interactions with DERs in North America have established an official language?	Language differences referenced in the footnote related to Hydro One 1 comment.	accepted
Hydro One 4	Jason Bonaface	System Restoration- I am still concerned about this specific issue as once voltage presence and frequency are returned, these DERs will resync to the Grid without contact to the Control Centre. Trying to maintain that balance of Generation and load during restoration path execution. Obviously a concern and I understand that some entities are looking at building some type of “heartbeat” into the system to provide the final piece before they reconnect which could bring some control to this. Will remain interested in progress in this area	Used Restoration as a footnoted example in the introduction of a reliability risk identified but not addressed at this time in this document.	accepted
ISO-NE 2	ISO-NE	Recommend making sure that specific indications are made where appropriate. For example, there are sections in this document that would only be applicable to inverter based generation, but not all DER is inverter based. Also, the requirements for DER on radial distribution may not necessarily apply to DER on sub-transmission networks.	Made various changes to implement the recommendation.	accepted
ISO-NE 3	ISO-NE	Consider if the test in the suggested deletion is too specific.	Deleted text	accepted
ISO-NE 4	ISO-NE	Consider revising the language. Perhaps too many ideas are included in this sentence. For example, this sentence discusses both downward ramping and current cessation of DER, which can	Divided thoughts into multiple sentences	accepted

NPCC Draft Guidance Document – An Approach for Distributed Energy Resources (DER) on Distribution Systems
Comments and disposition of comments

		be two very different operating modes.		
ISO-NE 5	ISO-NE	Should this [Resilience] be capitalized? This is not a defined term in the NPCC Glossary.	Added reference to Resilience. Will capitalize term in report	considered
ISO-NE 6	ISO-NE	May also complicate system restoration?	Added suggestion	accepted
ISO-NE 7	ISO-NE	Lengthy General comment regarding reliability principles. Request to simplify.	Provided edits to simplify	accepted
ISO-NE 8	ISO-NE	Consider revising this language – the words “assets” and “facilities” here don’t seem to work well together.	Reconciled assets and facilities. Focused on Facilities.	accepted
ISO-NE 9	ISO-NE	This paragraph seems out of place, considering that the rest of this section speaks on more broad terms around reliability principles. Suggested moving it to a location that better fits, like the second paragraph of the “Introduction and Objective” section that discusses possible reliability enhancements from DER.	Relocated paragraph	accepted
ISO-NE 10	ISO-NE	This NERC figure seems out place, as this is an NPCC document, and the figure lacks supporting language to fully describe it. For example, what is the definition of "R" and how is it measured? Also, based on its title, the figure doesn't appear to be a final NERC figure.	Fixed title – it is the “final” RISC model of Resilience.	considered
ISO-NE 11	ISO-NE	This [bulk power system] is sometimes capitalized, and sometimes it’s not. Recommend being consistent.	Settling on lower case for both ERO bulk power system and NPCC bulk power system and generic bulk power system references.	accepted
ISO NE 12	ISO-NE	Should state which task force was involved. Alternatively, this sentence could be deleted without impacting the content of this section.	Task Force was intended to be plural. Corrected	accepted
ISO NE 13	ISO-NE	Is this the NPCC RSC?	Answer - yes	No action
ISO NE 14	ISO-NE	This states that a list of items to be tracked as DER penetration increases, but then the list of items isn’t in a consistent format. For example, the first bullet calls out the item and then describes a need, the second and third bullets provide items and explain the reason they’re listed, the fourth bullet makes a statement on effects of increasing DER penetrations and the fifth bullet makes no mention of DER. The edits in this section are recommendations to keep the format consistent by simply stating the items that	Revised lists and accepted recommended edits	accepted

NPCC Draft Guidance Document – An Approach for Distributed Energy Resources (DER) on Distribution Systems
Comments and disposition of comments

		should be tracked		
ISO NE 15	ISO-NE	Unsure what issue this bullet is trying to convey.[last bullet in list]	Made an editorial change to make it clear	accepted
ISO NE 16	ISO-NE	...ISO-NE is concerned with the degree of specificity in the approach taken in this document in many of these sub-sections. For example, there are sections of this document that explicitly state criteria that is found in other standards and criteria documents. This approach can be problematic because quoting sections of other criteria documents increases duplication, may provide incomplete information, or the NPCC DER document may quickly become out of date if the quoted criteria changes. The issue of longevity is further impacted by likelihood that criteria and best practices will quickly evolve as DER focused efforts by larger industry groups (e.g. the NERC System Planning Impacts from Distributed Energy Resources working group) progress.	NPCC understands the concern, but believes that other entities in the region, which are not as advanced in the state of DER penetration as ISO-NE will benefit from the specificity. This is intended as guideline. An explanatory s statement has been added. NPCC envisions future version addressing evolutionary aspect of DER implementation.	considered
ISO-NE 17	ISO-NE	The items in these next few paragraphs seem to be general considerations	Accurate statement	considered
NAGF 4	Wayne Sipperly	Comment on “DER BES Impact Considerations” section Page 9: (DER Markets: Encouraging Points of Common Coupling and injection to where it is best utilized and at appropriate levels.) a. Recommend that marketing design should not be addressed in this interconnection document.	We are just noting that markets and reliability will have the same need which is knowing where DER is connected.	considered
NYISO 4	Greg Campoli	Comment on “NPCC Interconnection Guidance” section Page 9: (The type and size of the generation facility or energy storage system is based on electrical generator or inverter AC nameplate rating.)	Text has been changed to focus this sentence only on size.	considered
NYISO 5	Greg Campoli	The intent of this stand-alone sentence [see previous NYSIO comment) is unclear in this section between 2 paragraphs discussing protection and controllability. Recommending moving the sentence to a more applicable area and adding more details	Sentence has been moved to a more appropriate place.	accepted
ISO-NE 18	ISO-NE	Visibility of the distributed DER would be required for such operating procedures to be effective.	Accepted ISO-NE edit [should]	accepted
ISO-NE 19	ISO-NE	When considering the previous sentence, is this something that can be done in place of operating procedures, or in addition to	Provided a change to address ISO-NE point	accepted

**NPCC Draft Guidance Document – An Approach for Distributed Energy Resources (DER) on Distribution Systems
Comments and disposition of comments**

		operating procedures?		
ISO-NE 20	ISO-NE	Seems like this sentence is meant to convey a recommendation on how to specify the rating of a DER facility. The provided edits are based on this assumption.	Accepted ISO-NE edits	accepted
NAGF 5	Wayne Sipperly	Comment on “NPCC Interconnection Guidance” section Page 9: (Operating procedures for selecting which generation to curtail need to be in place.) a. Recommend that this document not include operational issues.	NPCC believes operational guidance should be included and the ability to balance generation and load in a high DER penetration future does need to be preserved. That is why this is pointed out.	considered.
ISO-NE 21	ISO-NE	Since this is a guidance document, it should not be establishing requirements.	Accepted ISO-NE edits	accepted
ISO-NE 22	ISO-NE	This can be read to say that protection could be different as load level varies (e.g. peak load vs. light load). Recommend clarifying this.	Dynamic protection with parameters that change with load levels may be needed in the long run. Provided an edit to more fully flesh out the concept.	accepted
ISO-NE 23	ISO-NE	Unclear what this paragraph is pointing to.	More specific cross reference provided	accepted
NAGF 6	Wayne Sipperly	Comment on “NPCC Interconnection Guidance” section Page 9: (The type and size of the generation facility or energy storage system is based on electrical generator or inverter AC nameplate rating.)	Accepted input. Sentence has been removed, but need for knowledge of facility output capability is retained elsewhere.	accepted
NAGF 7	Wayne Sipperly	Comment on “NPCC Interconnection Guidance” section Page 9: (requirements set forth in this document.) a. Disagree. This document is guidance. Will need to demonstrate compliance with the ISO/RTO, or interconnecting utility, and/or applicable NERC Reliability Standards.	Accept comment – numerous changes have been made to reflect that point that the document is for guidance purposes.	accepted
ISO-NE 24	ISO-NE	This is a guidance document, and so it should not be used to establish requirements.	Accepted ISO-NE edit	accepted
NAGF 8	Wayne Sipperly	Comment on “NPCC Interconnection Guidance” section Page 9: (wye grounded-wye grounded service transformers.) a. With increased DER penetration, will this give rise to GMD issues?	Increased sensitivity to GMD events was not considered. A footnote has been added to note this possibility for future.	accepted

**NPCC Draft Guidance Document – An Approach for Distributed Energy Resources (DER) on Distribution Systems
Comments and disposition of comments**

NAGF 9	Wayne Sipperly	Comment on “NPCC Interconnection Guidance” section Page 9: (Step 6 of the Application Process.) a. What process are we talking about here?	Removed reference to Step 6	accepted
ISO-NE 25	ISO-NE	IEEE 1547-2018 defines 0.88-1.10 as the minimum required continuous operating range. As currently written, this document would imply that DER should trip when outside this range, even if the capability of the inverter would allow for operation outside this range. Also, this recommendation does not state where the voltage should be measured (e.g. at the feeder, at the terminals of the inverters, etc....).	See responsive edits	accepted
NAGF 10	Wayne Sipperly	10. Comment on “NPCC Interconnection Guidance” section Page 10: (The requirements set forth in this document are intended to be consistent with those contained in the most current version of IEEE Standard 1547, Standard for Interconnecting Distributed Resources with Electric Power Systems. It is recommended that requirements in IEEE 1547 above and beyond those contained in this document or the interconnecting utility requirements, are to be followed and any other Standards included in or referenced to in IEEE Std. 1547 should be adhered to.) a. What about NERC IRPTF documents?	Changes to the text along with a footnote identifying future products from NERC subcommittees and working groups among other sources as sources for inclusion or reference when completed in this document has been added.	accepted
IESO 1	Daniel Sohm	Comment on “Voltage Response” section Page 10: (Should automatically initiate a disconnect sequence) a. This paragraph suggests that it is acceptable for DERs to disconnect if the voltage drops to 0.88 pu during a disturbance. This conflicts with the ride-through material below.	See responsive edits to make clear this past practice is being reconsidered	accepted
ISO-NE 26	ISO-NE	This sentence may imply that DER should trip for voltage excursions outside of the 0.95 to 1.05 p.u. voltage range. This is not correct, as per IEEE 1547.	See responsive edits	accepted
IESO 2	Daniel Sohm	Comment on “Frequency Support” section Page 10: (Should automatically initiate a disconnect sequence) a. DERs should remain connected even outside the prescribed frequency range if there is no risk to the equipment. The ride-through curves are “shall not trip above the curve,” not	Accepted comment and extracted advice for inclusion in the report	accepted

NPCC Draft Guidance Document – An Approach for Distributed Energy Resources (DER) on Distribution Systems

Comments and disposition of comments

		“must trip below the curve”.		
HQ 3	Aubut Noel	In the sections, «Voltage Response», «Frequency Support», «Reconnection to the Network» and «Inverters», the requirements in Quebec are more stringent than what is presented in the most recent version of the IEEE 1547 standard.	Thank for the information. Share the details and we can include HQ as a point of information for guidance.	considered
NYISO 6	Greg Campoli	6. Comment on “Frequency Support” section Page 10: a. Should there be some sort of mechanism to formally have TO/DP’s provide information as to which DER facilities are connected to feeders that have UFLS relays	Accepted and added a sentence to capture thought in the discussion of UFLS.	accepted
ISO-NE 27	ISO-NE	Not relevant to providing guidance on frequency support.	Accepted ISO-NE edit	accepted
ISO-NE 28	ISO-NE	Is this meant to be the continuous operating band? Note that these values are just single values from a curve, and the values in the curve for shorter time durations can exceed the stated band. In addition, the 59.3 Hz value seems to have come from the UFLS system performance curve within which system frequency should remain (e.g. PRC-006-3). This curve may not be the best source for setting frequency characteristics for generators. There are other standards that have frequency trip curves for generators (e.g. IEEE 1547, PRC-024-2, NPCC-006-NPCC-1 and D12). Note that the generator frequency trip curves may have a continuous operating range that go lower than 59.3Hz (e.g. 59 Hz in D12 and PRC-006-NPCC-1).	Accepted comment and extracted new information for inclusion in the report.	accepted
ISO-NE 29	ISO-NE	In accordance with IEEE-1547-2018, protective devices don't activate until 58.8Hz or 61.2Hz, not 59.3Hz or 60.5Hz	But NPCC has a different approach (59.3 and 60.5) in its UFLS standard.	considered
ISO-NE 30	ISO-NE	In this paragraph, as currently written, the guidance on how to set the frequency operating characteristics of inverters is not clear. For example, specific values are provided, but it’s not clear if the provided values are meant to designate a continuous operating range. Note that the IEEE 1547, PRC-006-NPCC-1 and PRC-024-2 provide generator trip characteristics in a curve format. Recommend to re-write this paragraph to state that: • The operating range of DER should be similar to other	Did not include ISO-NE proposal – requires further discussion with NPCC.	considered

**NPCC Draft Guidance Document – An Approach for Distributed Energy Resources (DER) on Distribution Systems
Comments and disposition of comments**

		conventional BES connected resources <ul style="list-style-type: none"> When setting DER frequency performance characteristics, the characteristics should be consistent with IEEE 1547, PRC-024 and PRC-006-NPCC. 		
ISO-NE 31	ISO-NE	5 minutes is the default recommendation in the IEEE standard, but this value can be adjusted. Recommend just pointing to the standard.	Accepted ISO-NE proposed edit	accepted
NAGF 11	Wayne Sipperly	Comment on “Reconnection to the Utility System” section Page 10: (minimum of five (5) minutes) a. This may vary and should be dependent on Regional requirements.	Accepted and covered in ISO-NE 31	accepted
IESO 3	Daniel Sohm	Comment on “Reconnection to the Utility System” section Page 10: (Five 5 minutes) a. IEEE 1547-2018 says to restore output in 0.4s.	Accepted comment and have noted change in the text.	accepted
ISO-NE 32	ISO-NE	Consider revising. Consider using “becomes”.	Accept ISO-NE proposed edit “becomes”	accepted
HQ 5	Aubut Noel	In section «Frequency Support», the frequency operating range used in Quebec is 59.4 to 60.6 Hz.	Have added a sentence to reflect this difference as the Quebec operating range and UFLS must operate outside this range.	accepted
HQ 6	Aubut Noel	A discussion of the aspects of voltage regulation and frequency regulation should be added to the sections «Voltage Response» and «Frequency Support». DER should have the capability to offer voltage and frequency regulation and the Utility should provide the exact parameters for those functionalities.	Some language was added to note that in Quebec voltage regulation and frequency performance differences exist. These statements could probably be made more specific by the HQ on further review.	accepted
ISO-NE 33	ISO-NE	Unsure what this is pointing to.	Clarified sentence	accepted
HQ 7	Aubut Noel	A section should be dedicated to «Ride-through capability» as this is of primary importance for resources connected to the grid, with the objective of maintaining bulk system reliability. Once again, IEEE-1547 addresses the topic. However, for voltage and frequency, what is required in the standard does not match the requirements in Quebec. For example, in under frequency, HQ’s requirement go as low as 55.5 Hz (for a short time period) while	Accepted comment and added Quebec specific information (from the comment) in the document	accepted

NPCC Draft Guidance Document – An Approach for Distributed Energy Resources (DER) on Distribution Systems
Comments and disposition of comments

		IEEE-1547 does not require mandatory operation below 57 Hz. We are concerned that future inverters might not be designed with voltage and frequency ride-through capabilities that correspond to the specific situation in Quebec and this is why we believe the NPCC should include Quebec’s particularities in its guidance document.		
NAGF 12	Wayne Sipperly	Comment on “Reconnection to the Utility System” section Page 11: (comply with other grid support utility interactive inverter functions statuses) a. Not sure what is being said here, simplify to state “provide” interactive inverter functional status?	Accepted change and modified text	accepted
NAGF 13	Wayne Sipperly	Comment on “Reconnection to the Utility System” section Page 11: (Section II.E, Power Quality) a. Of what document?	Accepted comment and removed stray reference	accepted
ISO-NE 34	ISO-NE	Unsure which “purpose” this is pointing to. Perhaps redundant with the first sentence of the first paragraph in this section?	Clarified sentence	accepted
ISO-NE 35	ISO-NE	This section seems to come directly from the ISO-NE SRD document. The requirements in the ISO-NE SRD were agreed upon by the MA-TSRG and adopted by the other NE states. This section, as written seems to imply that what’s listed should be followed as requirements. This is not consistent with this being an NPCC guidance document. Also, consider reviewing where this section may have overlap with the “Inverters” section.	This is presented as a guidance example. Accept ISO-NE comment. Have recrafted paragraph to make it clear this is how one NPCC Area dealt with the lack of grid support specifications in IEEE P1547-2003	accepted
NYISO 7	Greg Campoli	Comment on “Certification per UL 1741 SA as grid support utility interactive inverters” section Page 12: (The following additional performance requirements shall apply for all inverters)	This will be a good long direction, but the industry equipment standard to mandate it do not yet exist.	considered
NYISO 8	Greg Campoli	Reference to ISO-NE should be removed if these are IEEE Standards applicable to all areas as foundational requirements. There may be difference in model parameters used in the DER_A model which will be documented in an upcoming SS-38 report/presentation to the RCC.	Reference to ISO-NE has been removed	agreed
ISO-NE 36	ISO-NE	This is intended to be a guidance document, and not a	NPCC believes the specifications	considered

NPCC Draft Guidance Document – An Approach for Distributed Energy Resources (DER) on Distribution Systems
Comments and disposition of comments

		requirements document that would replace other criteria that has already been agreed on and in place.	should remain to provide detail for those areas not as advanced into the DER issue as ISO-NE. Reversed proposed deletion	
ISO-NE 37	ISO-NE	Seems redundant, especially considering suggested edits in preceding bullet.	NPCC believes the specifications should remain to provide detail for those areas not as advanced into the DER issue as ISO-NE. Reversed proposed deletion	considered
ISO-NE 38	ISO-NE	The details listed below are too specific for a guidance document that would be applicable to the general NPCC area.	NPCC believes the specifications should remain to provide detail for those areas not as advanced into the DER issue as ISO-NE. Reversed proposed deletion	considered
HQ 4	Aubut Noel	In section «Certification», the requirements should correspond to Category 3 inverters in Quebec.	Thank you for the information. Provide the details and we can include them as a point of information for guidance.	considered
NAGF 13	Wayne Sipperly	Comment on “Reconnection to the Utility System” section Page 11: (Section II.E, Power Quality) a. Of what document?	Modified text to make generic statement regarding power quality requirements.	accepted
ISO-NE 39	ISO-NE	This is a guidance document. As such, it should not establish requirements.	Accepted ISO-NE edit	accepted
ISO-NE 40	ISO-NE	This is a guidance document. As such, it should not establish requirements.	Accepted ISO-NE edit	accepted
ISO-NE 41	ISO-NE	This is a guidance document. As such, it should not establish requirements.	Accepted ISO-NE edit	accepted
ISO-NE 42	ISO-NE	Need to make clear that this is trying to address circumstances that are not directly related to a system disturbance. For example, if the DER protection is powered off the system AC, and there’s a disturbance that drives voltage to go too low and the control/protection loses power which then trips the DER, then the DER wouldn’t be meeting the necessary ride-through requirements.	Accepted ISO-NE comment and added suggested language	accepted

**NPCC Draft Guidance Document – An Approach for Distributed Energy Resources (DER) on Distribution Systems
Comments and disposition of comments**

ISO-NE 43	ISO-NE	Language seems awkward.	Made changes to address comment	accepted
CMP1 Metering	Keith Radonis	The document appears to cover items that are already part of CMP’s impact studies. From a metering perspective, after a quick initial review there does not appear to be anything new or unusual in the requirements listed in the document.	No change needed to respond to comment	accepted
CMP 2 Metering	Keith Radonis	CMP’s current metering policy for generators easily meets the requirements for Revenue Metering.	No change needed to respond to comment	accepted
CMP 3 Metering	Keith Radonis	The second paragraph of the Metering section seems to be more focused on real time information, SCADA, rather than Revenue Metering. It discusses the DER’s responsibility to be able to provide real time data points typical for an RTU. a. If the expectation is that the Revenue Meter at a DER would provide this information then the impact to metering would be a more expensive meter installed at these locations. This would primarily impact costs associated with smaller generations, like NEB accounts.	Made changes responsive to input that the relationship between revenue metering and metering for SCADA is a matter for the connection utility to decide.	accepted
CMP 4 metering	Keith Radonis	Regarding ‘SCADA’ or real-time monitoring provisions/requirements, the content in the document is fairly generic...our folks were not sure of the intent of this document: i.e. is it meant to act as the official set of requirements or just a guideline? a. There is a statement under the Metering section, second sentence that calls out that the requirements shall be consistent with the local utility’s requirements. Does that mean the document complies with the utility requirements or vice versa?	Intended that the DER complies with the utility requirements and overarching requirements of the local authority having jurisdiction over metering in the case of revenue metering. Have made changes to make this point clear.	accepted
CMP 5 metering	Keith Radonis	Direct comments from our metering folks are on page 16 (Metering Section) of the second attachment (NPCC DER Guidance Document s. roberge’s comments.pdf)	See next two CMP comments	N/A
CMP 1- Metering department	Scott Roberge	Comment on “Metering” section Page 16: (New metering or modifications to existing metering will be reviewed on a case-by-case basis and are to be consistent with metering requirements required by the local connecting utility and adopted by the local	Agreed and it is true throughout guideline.	accepted

NPCC Draft Guidance Document – An Approach for Distributed Energy Resources (DER) on Distribution Systems

Comments and disposition of comments

		regulatory jurisdiction.) o This points to CMP’s Generation Interconnection Requirements (Blue Book) and should be applicable to all requirements and not just metering.		
CMP 2- Metering department	Scott Roberge	2. Comment on “Metering” section Page 16: (mutually agreed upon) o I would strike the “mutually agreed upon” statement and require the DER to meet the “distributors” specified requirements.	Have removed phrase and provided new language.	accepted
ISO-NE 44	ISO-NE	Unclear what “aggregate connection” means in this sentence	Made changes to address comment	accepted
NAGF 14	Wayne Sipperly	Comment on “Metering” section Page 16: (time of interconnection) a. Not sure this is the correct language. Maybe use something like “prior to energization”.	Made modification to address prior to energization thought. Changed language	accepted
ISO-NE 45	ISO-NE	This is one, and perhaps the only, instance where allocation of costs is discussed. Consider if this language is necessary in this guidance document.	Accepted ISO-NE edit	accepted
ISO-NE 46	ISO-NE	As written, this whole section seems prescriptive, and seems to establish requirements, which is not consistent with this document being a guidance document.	Made change to address comment	accepted
ISO-NE 47	ISO-NE	What does “average” mean when applied to power factor?	Made change to address comment	accepted
NAGF 15	Wayne Sipperly	Suggest changing distributor to distribution utility and add DER/generator. a. Suggest adding “for the Distribution Provider (DP) or interconnecting utility” right before “to be able to monitor the availability and production of energy from these resources.”	Accepted and included suggested language	accepted
ISO-NE 48	ISO-NE	This sentence seems to require some editing.	Made change to address comment	accepted
HQ 8	Aubut Noel	In section «Power factor», the proposed text seems more to correspond to a situation associated with a load than a resource (generation). This section should be based more on the IEEE 1547 standard.	Made changes to reflect that the section is discussing generator output power factor, i.e. reactive support from sources.	Accepted.
NATF 16	Wayne Sipperly	Comment on “Power Factor” section Page 16: (PCC) a. Spell PCC out.	PCC was spelled out earlier in the document	considered
ISO-NE 49	ISO-NE	This is a guidance document, and as such should not establish	Accepted ISO-NE edit	accepted

NPCC Draft Guidance Document – An Approach for Distributed Energy Resources (DER) on Distribution Systems

Comments and disposition of comments

		requirements.		
IESO 4	Daniel Sohm	Comment on “Islanding” section Page 17: (direct transfer trip) We get comments that some small facilities are required to install transfer trip when they think it is not necessary, but the utility still requires it. I recommend elaborating on why and when direct transfer trip schemes are needed.	Made placeholder change to simply say that the decision rests with the connecting utility as if DTT is needed to protect the utility facility and the generating facility. Possible are for more elaboration by NPCC members in a future revision.	accepted
ISO-NE 50	ISO-NE	This is a guidance document, and as such should not establish requirements.	Accepted ISO-NE edit	accepted
ISO-NE 51	ISO-NE	Unclear what is “certain fault conditions resulting from system installations” means?	Made change to address comment	accepted
ISO-NE 52	ISO-NE	SS-38 is the working group on inter area dynamic analysis.	Made change to address comment	accepted
NYISO 9	Greg Campoli	Comment on “Underfrequency Load Shedding Programs” section Page 17: (An NPCC Load Modeling Working Group, SS-3, has studied the UFLS performance of the Region and determined that no change, at this time, is necessary in the UFLS program. The SS-38 has also performed some sensitivity analysis and determined that increased levels of DER penetration in the short term will not result in any significant degradation in UFLS performance.) a. I don’t think that this is a true statement. According to the NPCC 2018 UFLS assessment the SS-38 is planning to conduct an in-depth investigation into the dynamic effects of DG penetration in 2019. This work is ongoing in 2019.	Have left paragraph in place for NPCC staff review	considered
ISO-NE 53	ISO-NE	SS-38 has not finished their studies that are examining the impacts of DER on the NPCC UFLS program. Further, this paragraph doesn’t seem to provide value (i.e. any guidance related to DER). Recommend to delete this paragraph.	Have left paragraph in place for NPCC staff review	considered
ISO-NE 54	ISO-NE	Recommend that SS-38 finalize their studies before such conclusions are made. Also, the standards require that the UFLS programs be evaluated, so the technical studies to review the performance of the UFLS program need to be completed on a periodic basis (i.e. this is not something that would only be done	Have left paragraph in place for NPCC staff review	considered

NPCC Draft Guidance Document – An Approach for Distributed Energy Resources (DER) on Distribution Systems

Comments and disposition of comments

		on a voluntary basis).		
ISO-NE 55	ISO-NE	Li-Ion batteries is not the only battery type installed on the system. Most older battery back up systems use AGM's, and even older ones use Lead Acetate. Consider how this section could apply to all battery technologies.	Made change to address comment	accepted
Hydro One 3	Jason Bonaface	SCADA Communication requirements. As with all DERs above a certain MW level, they are required to provide SCADA telemetry data to the control center to monitor their output. This obviously ensures that they remain below their connection agreed output, but also allows us to observe status when working on a feeder in emergent or planned situations. We have encountered significant issues with getting compliance on this item from the DERs. We track and continually reinforce this message, but generally they continue to not repair or reconnect their telemetry devices. Obviously as these devices continue their penetration, we will clearly need to have these values as an operator of the power system.	Added Section entitled SCADA Communications Requirements	accepted
ISO-NE 56	ISO-NE	If this is being tied into the SS-38 work currently being carried out, then recommend the provided edits. The sensitivities run by SS-38 may not look at various penetration levels of DER for all areas as they work to fulfill the original sensitivity from the UFLS assessment and meet this year's corporate goal.	Left in place due to prior decision regarding SS-38 work underway. Accepted ISO-NE edits	accepted
NAGF 17	Wayne Sipperly	Comment on "Energy Storage Systems for DER" section Page 18: a. This section does not seem to add value, recommend to delete.	NPCC disagrees. Energy storage is being promoted aggressively in a number of NPCC Areas. The topic will evolve in the future.	considered
ISO-NE 57	ISO-NE	There is no reference to DER in these three items.	Made changes to address comment	accepted
ISO-NE 58	ISO-NE	There is no reference to DER in this item.	Made change to address comment	accepted
NYISO 10	Greg Campoli	10. Comment on "Planning Related Recommendations Due to Changing Resources Mix" section Page 18: (Clearly identify DER in the NPCC Region's Area Queues, where DER is being proposed for installation and magnitudes relative to the existing resource base and load projections.) a. DER resources can go through an Area, Transmission	Have added this footnote to the recommendation. "Of concern is that in certain jurisdictions, DER resources can go through an Area, Transmission Owner, or States interconnection	accepted

NPCC Draft Guidance Document – An Approach for Distributed Energy Resources (DER) on Distribution Systems

Comments and disposition of comments

		Owner, or States interconnection processes. Is NPCC only interested in providing guidance on DER interconnections through the Area’s process?	processes and those data bases may contain duplicate entries. Failure to reconcile multiple queues is a reliability risk issue”	
ISO-NE 59	ISO-NE	Consider if this should be PV forecast data, since queues may not capture well the distribution connected DER that will get built.	Made change to address comment	accepted
NYISO	Greg Campoli	11. Comment on “Planning Related Recommendations Due to Changing Resources Mix” section Page 18: (Obtain modeling data to enable modeling of the BES for the purpose of Long-Term Resource Planning with DER) a. Obtaining the DER resource data continues to be a point of concern. The NERC SPIDERWG has drafted a SAR for MOD-032 that states, in effect, the Distribution Providers will be responsible for providing DER data. However, some entities at NERC believe that MOD-32 is already sufficient to collect the necessary data. What is NPCCs position/views as to what entities should be responsible for providing DER data to their Planning Coordinator for the purposes of model building?	Have added a footnote to the recommendation to note issue as to who should provide data to the PC	accepted
ISO-NE 60	ISO-NE	There is no reference to DER in this item.	Made change to address comment	accepted
ISO-NE 61	ISO-NE	There is no reference to DER in this item.	Made change to address comment	accepted
NAGF 18	Wayne Sipperly	Comment on “Planning Related Recommendations Due to Changing Resource Mix” section Page 18: a. Suggest to add “Long-Term Resource, and Long-Term Transmission before “Planning of the BES”.	Made change to address comment	accepted
ISO-NE 62	ISO-NE	Unclear what many of these specifications may entail.	Consider adding an appendix with all the connection specification documents reviewed	considered
NAGF 19	Wayne Sipperly	19. Comment on “Planning Related Recommendations Due to Changing Resource Mix” section Page 19: (#10 and #11) a. Combine with #8.	Have consolidated recommendations 8, 10, 11 into #8 as suggested	accepted
ISO-NE 63	ISO-NE	In NE, this functionality needs to be present, but may not be enabled. Suggest to add in the following footnote: “The functionality is required to be present, but the default state is to have this functionality disabled unless otherwise directed by the	Have added footnote	accepted

NPCC Draft Guidance Document – An Approach for Distributed Energy Resources (DER) on Distribution Systems
Comments and disposition of comments

		area EPS operator.”		
ISO-NE 64	ISO-NE	In NE, this functionality needs to be present, but may not be enabled. Suggest to add in the following footnote: “The functionality is required to be present, but the default state is to have this functionality disabled unless otherwise directed by the area EPS operator.”	Have added footnote	accepted
NYISO 1	Greg Campoli	Comment on “Introduction and Objective” section Page 3: (Appendix B of this document provides a comparison of NPCC’s Area requirements to help identify opportunities for guidance.) a. The lack of details in Appendix B does not lend itself well providing information that can “help identify opportunities for guidance.” Recommend adding more details regarding each Areas requirements.	We are considering attaching all public documents in an appendix, but some documents provided were not public and were offered in confidence.	considered
NYISO 12	Greg Campoli	Comment on “Appendix B, NPCC Areas-Comparisons” section Page 21: (NY SIR) a. Is there a place we can define the acronym SIR (Standardized Interconnection Requirement)	A footnote has been added to the SIR reference in the table, with a link to the relevant SIR document on the DPS website	accepted
NAGF 20	Wayne Sipperly	Comment on “Appendix B, NPCC Areas-Comparison” section Page 22: a. Does not include NERC IRPTF documents in the comparison.	At the time of the original development of the comparison table, the IRPTF work product was not available. Comparison has not been made. Potential future work.	Considered.