Common Technical Standards Manual					
Section	**Title**	**Content from the Stds Manual**	**Industry Comments**	**DOER Comments**	**EDC Comments**
Section 4.1	Screening Process	If the EMT ROI study has unacceptable results per latest EDC approved version of IEEE 1547, then a Direct Transfer Trip (DTT) solution will be imposed.	On behalf of industry comment, If DTT will be enforced, what technologies will be used for DTT. Is the developer responsible for miles of new fiber, or can inverters with SMART functionality avoid the cost of DTT by implementing it without any extra equipment?	NA	Not necessary in getting into details in this document
		Unique arrangements not explicitly defined within this document at Eversource's discretion. This includes a consideration of off-normal circuit configurations.	More clarity is needed on the specific "unique arrangements" that would require DTT	NA	This was Eversource specific comment. Unique arrangements here would mean customer owned gear where the Protection relay package would be taken into consideration or a scenario where multiple feeds are to the Site within this Switchgear arrangement.
			Proposed to be larger than 500 kW	NA	Unitil would agree to this proposal. Eversource & National Grid will discuss this SMEs in their respective Companies to see if we can align on this requirement.
Section 4.2	Reclose Blocking	**Eversource only.** Reclose Blocking is not applicable to Eversource	Industry would like to more fully understand why there is such a difference in acceptable solutions between EDC's.	NA	Each EDC's Protection philosophy differs from each other as they are responsible for their own technical standards in operating their system in a safe & reliable manner.
Section 5.0	DER Capacity- Feeder Limits	Larger amounts of generation may be interconnected at the expense of the Interconnecting Customer by reconductoring or replacing equipment on a feeder as necessary to accommodate the increased thermal loading. Larger generation can be interconnected to express feeders if proper cable size is used and a new feeder breaker position is available.	What project size would be considered a larger generator? >20 MW?	NA	EDC's propose to cross off this paragraph to avoid confusion and add a statement in refering to each EDC's Planning criteria.
		In all studied cases, the addition of the DER shall not cause any thermal criteria violations on feeders under normal (N-0) and contingency (N-1) operations where applicable. The following limitations should be considered for forward and reverse loadings. Please note that forward loading limitation is only applicable to ESS applications.	Is load growth applied or omitted during calculations?	NA	This comment was specific to Eversource. The Compnay includes only confirmed load growth projects in the impact study analysis.
Section 6.1	Remote Monitoring & Control Threshold Requirements	A recloser & a DER Gateway may be required for all sites ≥500kW sites.	1. Proposal to make this larger than 500 kW. 2. On behalf of industry comment, need to clarify that this requirement is for NEW applications only and will not be enforced on post-ISA change requests, especially for projects post PTO. Is recloser required for BTM (non-export) applications with Eversource?	NA	1. Unitil agrees to the proposal of requirement on larger than 500 kW. Eversource & National Grid will evaluate this requirement internally with the SMEs to see if we can align the operational practices. 2. The SCADA requirement will hold true for BTM projects. The requirements on the SCADA equipment for online projects would be addressed in the DER Equipment Replacement sub-group so this issue should be addressed there. Once a concensus is reached then this section would be updated accordingly.
Section 7.2	External Disconnects	The switch shall at minimum provide a visible break	Proposed to cross-off visible break to a switch which is 'listed'	NA	The switch has to be a visible break switch for safety. This is an OSHA requirement.
Section 8.4	Testing Points	The Joint Utilities may require additional protection and functionalities not listed here depending on the site configuration. For example, Self Protection Over-Voltage (SPOV) and inverter Volt/VAR control function must be tested during the witness test.	NA	Unsure how this would be tested in the field as it requires creating high voltage on the lines connected to the inverters. This would generally be covered by 1574.1 LROV tests. GFOV concerns would be dealt with via effective grounding.	Agreed. This statement will be re-written to state that the set-points within the inverter settings to be verified during Witness Tests.
Section 10	GSU Transformer Winding Configurations	Secondary Grounding Transformer	NA	No significant change here, but want to note that this is the crux of GFOV issues. Both "effectively grounded" and "secondary grounding transformer" are the same thing. Not sure if EDCs are trying to note different pathways to achieving effective grounding. What's not stated is how the grounding xfmr is sized for inverters, which should include consideration of the load. Generally, supplemental grounding xfmrs are not necessary due to load providing grounding.	The Table 4 showed the acceptable grounding transformer configurations. How it meets the effective grounding pertains to each EDC's Technical Guide which is not the purpose of this section.
Section 12.2	Capacity Limit	The minimum forward loading of the transformer shall be considered for the Capacity limit assessment. Reverse power flow that will significantly add to the transformer insulation loss of life on a routine basis, based on the transformer specification and the insulation aging description in the latest version of IEEE Std. C57.91, will be evaluated. Any required transformer upgrades will be included in system modifications required to interconnect the DER facility.	NA	Good change as it reflects actual system conditions. The rest of the paragraph is very vague as to how xfmr life will be assessed. We'd expect that only actual likely nameplate exceedances would be considered based on load profile over time. It may be instructive to look at the results of PNNLs study on inadvertent export if that's a concern being addressed here (probably not?): Evaluating the Thermal Impacts of Inadvertent Export on Service Transformers	This section is enphasizing the fact that forward load is considered when assessing the thermal limittiaions of the Transformer. It does not get into the concept of inadvertant export. This is more for the Substation Transformer thermal evaluation.
Section 12.3	Transmission Ground Fault Protection	DTT may be used to disconnect the facility for transmission faults.	NA	See IREC's paper Deconstructing DTT – DTT can be used on the transmission system to disconnect the substation, but DTT to the DER location should not be necessary. The feeder breakers can be opened upon detection of faults instead.	EDC's will review this requirement with their respective Protection department.
Section 14	Voltage Flicker & Rapid Voltage Change	During the Expedited Review process, voltage deviations of greater than 2.0% will prompt the application to be moved to a full System Impact Study.	NA	Why 2.0% and not 3.0% in line with 1547-2018?! Language below is much preferred	Agreed, should be revised to 3%.
Section 16.3	Limiting Import &Export	A utility-grade, ANSI C37.90 is required for limit control functions.	On behalf of industry comment, can we add "unless a utility-approved Certified Power Control System is allowed by the utility"	NA	Each EDC has their own operating procedures that may require for certain size applicants to program such import & export limitations within the power control module versus utilizing external certified relays.
		Class I resources (less than or equal to 60kW) on radial feeders shall not be subject to ANSI C37.90 relay requirements.	NA	Does this need to be revised if/once IX rule revisions are adopted re PCS export limitation?	Agreed, once the Tariff is updated then this section will be updated as well.
		For analysis related to fault conditions and risk of islanding concerns it is necessary to consider the full nameplate capacity of the inverters, therefore the limited site export generation would ***NOT*** be used in the calculation/analysis of these conditions.	NA	IREC generally tries to note that this would be the case absent any manufacturer supplied test data that shows they can limit fault currents through some means.	EDC's to date have not received such manufacturer data sheet. Furthermore, each EDC reserve the right in conducting appropriate studies in esnuring safety & reliability of the system.
Section 16.4	Charging Methods	If requesting to charge from the Utility source, the Utility may, in its sole discretion, elect to evaluate the charging aspect of the design as a load customer.	Clarification is needed on whether the additional study can be completed in parallel with the typical interconnection studies if desired	NA	There is no additional study that is being proposed here. It is the charging scenario of the BESS that is taken into study consideration.
Section 17	Significant vs Moderate Changes	Customer Impact vs Engineering Impact	1. On behalf of industry comment. We need more clarity on "Customer Impact" This is to broad and encompasses items that industry would not consider enough of an impact to prevent changes. 2. On behalf of industry comment, This needs to be qualified by some range (e.g., more than 10% of the remaining hosting capacity). This statement, as is, mean ANY increase in kW AC (even 1 kW AC) is "Significant". It should also factor in whether this project is actually ENABLING additional hosting capacity. So, maybe say change in hosting capacity after considering upgrades paid for by the customer. Similarly "causing delay" could mean 1 day of added delay. It needs to be material, and to allow for a minimal restudy period (e.g., 20 BD or something; let's discuss).	NA	This topic was discussed at length in prior meetings some time ago. It is not possible to list out every single scenario in this document to state what is needed to consider a change by the Customer being significant. Open to hear any unique clarification that is needed here.
Section 18	Transient Overvoltage (TOV)	Transient overvoltage is of concern due to potential load rejection overvoltage (LROV) and Ground Fault Overvoltage (GFOV) by inverter-based DER. There is concern that during step changes in load (such as tripping of an upstream device) as well as single-phase to ground fault condition, the proposed inverters may cause transient over voltage more than 1.2 pu.	NA	7.4.2 doesn't require limitation of voltage to 1.2pu, nor does the definition of effective grounding (which is 1.38pu over one cycle). I'd suggest editing this as shown.	Agreed with theproposal of crossing off the 'more than 1.2 pu' in this sentence.
		Eversource: The aggregate DER to minimum gross load ratio will be determined for the proposed feeder(s). If the ratio exceeds 115% then there is potential for transient overvoltage concerns and an EMT study may be required. If the EMT study is required and analysis determines that a TOV condition is caused by the DER, mitigation or combination of mitigations, such as, but not limited to, Self-Protection Overvoltage (SPOV) enabling in the inverter, revising grounding system, and Surge Arrestors at POI or Substation may be required.	NA	EMT seems unnecessary to accomplish this. UL 1741 SB inverters are tested to ensure LROV does not exceed 1547 thresholds. GFOV is mitigated by load (i.e. 1/3 load is Yg connected) or a resistively grounded grounding bank which considers load in the calculation of values.	This comment was specific to Eversource. The Company has conducted the EMT studies anytime there are concerns for TOVs based on screening and have found in multiple occasions of such TOV violations. Each Company reserve the right in conducting any appropriate studies in ensuring compliance to the IEEE 1547 standard and for the safety & reliability of the system.