

Category	Page	Subclause	Line	Comment	Mus	Proposed Change	Disposition Status	Disposition Detail
Technical	1	1.1	17	Change "This standard explores..." to "This recommended practice explores...". This document is a recommended practice, not a standard. In IEEE-SA usage "standards" can include standards, recommended practices, and guides. But, few persons using these documents understand this nicety. The scope must state "recommended practice", not "standard".	Yes	Change "This standard explores..." to "This recommended practice explores..."	Rejected	The scope was approved by the IEEE-SA New Standards Committee at the time the PAR was approved and cannot be changed except by a request made to the committee.
Technical	2	4	20	Engineer should obtain from the Utility company a 'range' of fault current that the utility may provide under fault conditions. Not just the usual maximum. If this is not addressed elsewhere in this document then address here. Though this is not a document the utility company will feel obliged to comply with, listing the requirement here may give the design engineer additional support when attempting to obtain the information from the utility company.	Yes	Add the following: The engineer should obtain from the utility company a range for fault current available at the point where the utility connects. Obtaining only the maximum theoretical value is not enough. It is important to also know what the possible minimum fault current available is as well.	Revised	Added the proposed text with some minor editing.
Editorial	2	4.2.1		The term 'customer' is used here, presumably in reference to the owner of the industrial or commercial facility. However, the word 'customer' actually refers to the role of one of the parties in a commercial relationship. However, the commercial relationships that may exist in between the owner of the industrial or commercial facility, the grid host and the energy supplier may be so complex that the term 'customer' is misleading. It is suggested that the document be edited to replace the term 'customer' with terminology that avoids any reference to a commercial relationship between parties.	No	It is suggested that the document be edited to replace the term 'customer' with terminology that avoids any reference to a commercial relationship between parties. One possible solution would be to preface the discussion by defining the roles of the parties in the relationship.	Revised	Inserted a section on "Common relationships with utilities" immediately following the Definitions section.
General	3	4.2.1	6	While it is helpful to list typical available voltages (240V Delta, 208Y/120V, 480Y/277V) it may be useful to add a sentence or two discussing common non-standard voltages. Many users of this standard will look to this section when confronting such non-standard voltages, after all. An example would be the unavailability of 480Y/277V in the District of Columbia; the attached PEPCO handbook Article 113 Table 1 shows that 460Y/265V is available but 480Y/277V is not.	No	Add a sentence or two for common (but atypical) voltages, with some explanation of why these are atypical. Users of the standard would then learn both the "what" and "why" when encountering these voltages. Examples include 240/120 high-leg delta, still offered by many utilities but only as a replacement for existing systems due to the perceived danger (the system is often called	Revised	A few sentences have been added to alert the reader that such voltages may be present, but unavailable for new facilities.
Editorial	3	4.2.1	9	Typo: "When the facilities load becomes..."	No	"When the facility's load becomes..."	Accepted	
Editorial	3	4.2.1	16	...and, therefore ...	No	...and, usually...	Accepted	
General	3	4.2.3.1	30	Besides the connecting of standby generators consideration should be given to distributed generation connected to the facility. The expanding use of solar power and electric storage will have	No	Add to line 35: "Consideration should also be given to any paralleled generation (e.g. solar power) or electric storage (e.g. battery storage)."		At this time, it is debatable whether renewable sources enhance reliability. The majority of present applications depend on connection to the utility source. Only when there is electrical storage could a renewable source provide backup power.
General	3	4.2.3.4		The point about operating staff is valid, but doesn't address the full issue	No	This section could be expanded to include the need for system documentation that guides operating personnel to the appropriate actions in the event of critical events on the system (fire, unplanned interruptions, etc). In addition, it would be appropriate to recommend that critical	Rejected	This information is not relevant in the context of planning the electrical service.
General	4	4.2.3.2	4	Reliability of the electric system will be dependent on distributed energy resources as well as other loads.	No	Change the sentence starting on line 4 to: "The reliability of the electric service is also dependent upon the other loads as well as distributed energy resources on the same distribution		Another paralleled source on the distribution system may provide some momentary support. It is questionable whether it is a good practice to rely on these sources.
Editorial	4	4.2.3.4	24	Mis-spelling of "Howeverm"	No	However,	Accepted	
Editorial	4	4.2.3.4	24	"Howeverm a limited ..." is a typo	No	Change to: However, a limited ...	Accepted	
General	4	4.2.3.4	24	Typo: "Howeverm a limited..."	No	"However a limited..."	Accepted	
Technical	4	4.2.3.5	39	Designers should be encourage to use safety by design concepts and to go over an above the minimum installation requirements of the NEC (or CSA and equivalents).	Yes	After line 39 add: -- Arc Flash and or other protection that enhances maintenance and operational safety. Protection to mitigate electrical hazards may be more than that required to meet the minimum requirement of installation codes, how it should be considered within the context of Safety-by-design principles and the Hierarchy of hazard control measures provided in NFPA 70E and ANSI Z10.	Accepted	
General	6	4.3	16	...or under-load type)...	No	... or on-load type)...	Accepted	
Editorial	6	4.3	34	The term "residential" has no meaning. Either correct the term or define it.	Yes	Correct "residential" to the proper term or else define it.	Accepted	Revised to correct typographical error. Should be "residential."
Editorial	6	4.3	34	Mis-spelling of "Residential"	No	Residential	Accepted	Revised to correct typographical error. Should be "residential."
General	6	4.3	41	Generators may infer only synchronous and induction machines. Need to also include inverter connected generation.	No	Replace the words "generators are" with "generation (i.e. synchronous, induction, or	Accepted	
General	8	4.4	13	Consider adding system impedance or X/R ratio.	No	k) Available short-circuit capacity and impedance (###+j## or X/R ratio) of the supply system.	Rejected	Not necessary to obtain both capacity (assumed expressed in MVA or kA) and impedance. The phrase could be changed to "short circuit capacity or impedance," however, it is felt that the list does not need this level of detail.
Technical	8	4.4	13	Engineer should obtain and utility should provide the 'range' of short circuit capacity" possible at utility service point. This is important to achieve good Arc Flash incident energy calculations.	Yes	change: from; k) Available short-circuit capacity of the supply system to; Available minimum and maximum short-circuit capacity of the supply system (minimum and maximum is required to execute the required arc flash incident energy calculations)	Revised	Revised to "k) Available minimum and maximum short-circuit capacity of the supply system, accounting for likely future changes to the utility distribution system (maximum values are used for determining suitability of interrupters applied in the system while arc flash incident energy calculations should use these and minimum values to determine maximum arc flash energy conditions)"

General	8	4.4	13	Add also 'future' sc	No	Add "expected future short circuit"...	Revised	Revised to "k) Available minimum and maximum short-circuit capacity of the supply system, accounting for likely future changes to the utility distribution system (maximum values are used for determining suitability of interrupters applied in the system while arc flash incident energy calculations should use these and minimum values to determine maximum arc flash energy conditions)"
Editorial	9	5.2	24	energy is abbreviated kWh instead of kWh here and on line 27.	No	use kWh	Accepted	
General	9	5.2	24	Typo (lines 24 and 27) uppercase H in kWh	No	kWh	Accepted	
Editorial	9	5.2	24	Inconsistent use of kWh and kWh. Seen on line 24 and 27	Yes	change "kWH" to "kWh"	Accepted	
General	9	5.2	37	I would add flicker to the list as item 8	No		Revised	Flicker is usually a condition resulting from motor starting, covered by item 7, power quality. A reference to flicker was added in item 7 rather than making this a separate item.
Editorial	14	6.5	18	"The ustomer generally ..." is missing a c	No	Change to: The customer generally ...	Accepted	Corrected spelling
Editorial	14	6.5	18	Correct spelling of "ustomer" to "customer".	Yes	Correct spelling of "ustomer" to "customer".	Accepted	Corrected spelling
Editorial	14	6.5	18	'c' left off of customer	No	correct spelling	Accepted	Corrected spelling
General	14	6.5	36	Do not think that M should be capitalized.	Yes	Change "Electronic Meters" to "Electronic meters"	Accepted	
Editorial	14	4.2.3.4	24	typographical error in spelling of however	Yes	"Howeverm" to "However"	Accepted	
Editorial	17	6.7.3	3	"rent Inclusion:" should be capitalized.	No	Change to: Rent Inclusion:	Accepted	
Editorial	19	7.4	2	missing word? "...by dedicated industrial substations can be designed, constructed, and..."	No	"...by dedicated industrial substations that can be designed, constructed, and..."	Accepted	
Editorial	20	8	7	Missing punctuation in last sentence of paragraph.	No	Add correct punctuation (period) at end of line 7	Accepted	
General	21	8.1.2.2	8	This section would benefit greatly from a short description of recent understandings regarding chop current surge risk to service entrances due to the low cost of Vacuum Fault Interrupters and SF-6 switches permitting their use much closer than in the past. Several papers from David Shipp (formerly of Eaton Corporation) could be referenced here, alerting users of this standard to the potential risk. In the past, power switching surges originated much more distantly from the service. High frequency switching chop current was less of an issue as the high cost of devices having these characteristics prevented	No	Add a short description of chop current, it's association with non-air-break devices, and technology advances that have reduced the cost of these devices permitting more widespread use.	Rejected	Section 8.1 covers Overhead Service. This proposed text is not appropriate in the context of overhead service.
Technical	24	8.3	15	A minimum radius of 7.62m (300 inches) seems excessive.	No	Need to substantiate this and revise if needed.	Rejected	Found examples in underground specs referring to 25 foot radius sweeps for changes in direction (Caltrain 16130, 2011)
Editorial	26	9.3	18	misspelling	Yes	consideration	Accepted	
Editorial	26	9.3	18	Mis-spelling of "Consideratioan"	No	Consideration	Accepted	
Technical	26	9.3	28	regarding arc flash labels there should be mention of NFPA 70E and NFPA 70, as well as T1D principles.	Yes	Determine arc flash boundaries and post warnings at all locations where extra precautions are 28 to be taken. Follow NFPA 70E, NFPA 70 and prevention through design principles including determination of arc flash boundaries and posting of suitable warnings at all locations where precautions need to be taken.	Revised	Added "Follow NFPA 70E, NFPA 70 and prevention-through-design principles. Determine arc flash boundaries (IEEE 1584 and NFPA 70E Art. 130.4) and post warning labels according to ANSI Z535.5 and NFPA 70E Art. 130.5(D) at all locations where precautions are to be taken."
Technical	26	9.3	28	Determining the Arc Flash Boundaries (IEEE 1584 and NFPA 70E Art. 130), should be followed with the requirements to post the "labeling" (warning label) per OSHA requirements and the NEC 70E (Art. 130.5(D)). This is an employer issue, but the text does mention "Electrical Requirements" in line 19 of the same page with mention of posting warnings.	No	Reword: Determine arc flash boundaries (IEEE 1584 and NFPA 70E Art. 130.4) and post warning labels according to ANSI Z535.5 and NFPA 70E Art. 130.5(D) at all locations where precautions are to be taken.	Revised	Added "Follow NFPA 70E, NFPA 70 and prevention-through-design principles. Determine arc flash boundaries (IEEE 1584 and NFPA 70E Art. 130.4) and post warning labels according to ANSI Z535.5 and NFPA 70E Art. 130.5(D) at all locations where precautions are to be taken."
General	28	9.5.1	19	"1936 mm 2/kVA"	No	Please fix units	Accepted	
General	28	9.5.1	19	This is a global comment. The use of purely metric measures without some "hint" as to what the customary US measures would be is a distinct disservice to the reader. An example is 1936 mm2, which is more easily understood as 3 in2.	Yes	Please add parenthetical US customary measures on all metric measures.	Accepted	
General	28	9.5.1	33	It would be helpful to alert users of this standard to a minimum recommended head height for use in mechanical lifting/removal of utility transformers in indoor vaults. Attached is a vault agreement from Dominion Virginia Power outlining a simple "double transformer height" requirement that permits their standard lift truck to insert and remove transformers	No	Add a sentence advising that some utilities require non-obvious minimum head heights to permit mechanized insertion/removal of transformers in vaults.	Revised	Added, "When providing a vault for utility-owned equipment, consult with the utility on their requirements. These requirements may include such items as minimum access dimensions, minimum vault dimensions, oil containment (if applicable), lighting and ventilation."
Technical	28	9.5.1.	37	Question concrete wall thickness of 200 mm (8 inches). NEC450.42 requires four inches minimum and Information Note 2 refers to 6 inches.	No	Need to substantiate this text and possibly revise.		
General	31	9.6.2	17	"order of two 410 ..."	No	I think it shall read "order of 410 ..."		Found references to sidewalk loads of 600 lbs/sq ft (2929 kg/sq m). And others much smaller. Suggest referring to local codes rather than providing a specific value.
Editorial	32	9.6.3	19	hot-spot is a non-recommended term in C57.12.80. Hottest-spot is the recommended term.	No	use recommended term	Accepted	
General	34	9.7.4	16	Technically NEC 110.26(B) only prohibits storage and other purposes for the working space in Electrical rooms, and not the entire room. I have had inspectors cite this on jobs, and while I agree completely with the concept the wording of the Code does not support this.	No	Clarify the NEC reference applies only to electrical working space within the electrical room, not the entire room.	Revised	The sentence is revised to indicate that the NESC prohibits storage in electrical rooms and spaces, whereas the NEC prohibits storage in defined working space.
Editorial	34	9.7.4	30	Delete " -- Watertight". NEMA 4 is not watertight. Flood the area around the equipment and water will get in.	Yes	Delete " -- Watertight".	Revised	Replaced "Watertight" with "intended to protect from splashing water seepage of water, falling or hose directed water, but not intended for submersible applications."

General	38	10.6.2		This section is fine insofar as 'large services' are concerned. However, in today's applications active sources of energy may be integrated into even the smallest installations (the individual residence). Therefore, the issue of distributed generations should be treated as a universal issue and not an anomaly limited to large services.	No	The entire document should be edited to refer to prevailing standards that address integration of active sources behind any meter. However, it is suggested that the authors refrain from attempting to make this a definitive treatise on dealing with non-utility generation. Instead, the point should be made that almost any installation may include active sources, and simply refer to other standards on techniques for treating those sources.	Rejected	This material is expected to be covered in 3005.8, "Recommended Practice for the Application of Distributed Generation to Industrial and Commercial Power Systems." The primary focus of this standard is on the service and not on onsite generation. To that end, a higher priority is to convey the intent to install onsite generation to the utility and to understand the utilities' interconnection requirements, which are among items noted in D3 section 4.4 and 4.5.
Editorial	38	9.5.1	19	Think this is an error in the use of exponent to mean dimension of square area	Yes	change "1936 mm 2/kVA" to show the 2 to be raised to depict a square of mm. Difficult to	Accepted	
Technical	39	10.6.3.2	16	if not addressed sufficiently elsewhere add available fault current range, minimum and maximum!	Yes	Add the following requirement: Possible maximum and minimum fault current available from the utility company to properly calculate the equipment ratings required (requires maximum) and the arc flash hazard (requires maximum and minimum) to personnel at the facility.	Rejected	This is covered adequately in the general material that precedes this. This section addresses issues specific to substations and connections to utility transmission systems.
General	39	9.5.2	42	My view of lines 42 and 43 showed the text height got smaller on the last sentence of 9.5.2. Not sure if on purpose but it	Yes	Change text properties of the last sentence of 9.5.2 to match the rest of the paragraph	Accepted	Text formatting will be reviewed by IEEE-SA editorial staff prior to publication.
General	43	10.6.4	8	(55 C/65 C)	No	My understanding that the 55 C is kept for historical reasons. As of now all units are designed for 65 C with the use of upgraded papers Indeed C57.12.00 does not even mention 55 C	Revised	The sentence is poorly worded. Revised to, "Lower transformer temperature rise ratings applied on designs otherwise designed for 65 °C rise (55 °C/65 °C rise)..."
General	46	10.6.9		The proposed text addresses only the issue of the time required to construct the substation. While that's important, the dialog that takes place between the facility owner and the grid host should also consider the schedule that the owner has for completing the facility, including the need for temporary power during construction.	No	This section should be broadened to address the overall project schedule, including the need for temporary construction power while the substation is being erected. Also, the Gantt chart in Fig 3 should be cleaned up and should not include actual calendar dates, especially dates that are no thirty years in the past.	Revised	Revised Gantt chart as proposed. Added additional text, "The substation schedule must be coordinated with other related facility project activities. For example, for a greenfield site, the substation schedule must be coordinated with the overall facility design and construction schedule. The substation schedule may need to accommodate the need for the substation to supply temporary construction power prior to full facility operation. In the case of a service upgrade, the coordination of transferring load from the existing service to the new substation must be considered."
Editorial	47	10.6.11	18	"Resolution of the items in Section 5.6.10 above."	No	correct reference	Accepted	
General	48	10.6.11	1	Quality of figure 3 should be improved. Redo in Excel if required.	Yes	Redraw figure 3.	Accepted	
Editorial	48	10.6.9	1	Figure 3 is largely unreadable. Improve the graphic so that it is readable.	Yes	Figure 3 is largely unreadable. Improve the graphic so that it is readable.	Accepted	
Editorial	50	10.6.3.8	41	typographical error of the plural form of facility Also same error on line 42	Yes	change "facilitys" to "facilities". Also change on line 42	Accepted	
General	50	10.7.3.4		Crushed limestone is not the only acceptable surfacing material.	No	Delete the referent to 'crushed limestone', and replace it with a more generic term, eg 'crushed	Accepted	
General	50	10.7.3.6		Airborne contamination is not the only concern.	No	Need to mention the need to have agreements/limitations on audible noise and	Revised	Added additional section, Environmental considerations.
Editorial	51	10.7.4.2	28	Correct spelling of "Buchholtz" to "Buchholz".	Yes	Correct spelling of "Buchholtz" to "Buchholz".	Accepted	
General	52	10.7.4.2	5	Add definition table to Fig 5, for consistency with the other	No		Accepted	
General	53	10.7.4.2	11	the term "operate", "blow" and "melt" should be reworded to "open".	No	Revise "operate" in line 11 to "open" and "blow" in line 12 to "open the". Revise "melt" to "open in line 1 on page 54.	Accepted	
General	55	10.7.6		Need to mention that the drawings may need to be reviewed and sealed by a professional engineer.	No	Add reference to professional engineer review of drawings.	Revised	Added, "The drawings may need to be reviewed and sealed by a licensed professional engineer."
Technical	57	10.8.3	7	Please attached file	Yes	Please see the attached file for proposed text copied from the current revision of IEEE 1242. Thanks, -Ben	Revised	File not attached. Inserted proposal as a rogue comment. The clause discusses acceptance testing, and the first part of proposed item 2. refers to factory testing, which is not appropriate. The current IEEE 1242 (1999) was referred to and the proposed text was not substantiated. Further investigation in IEEE Std 3007.2 found, "DC hi-pot testing continues to be used for acceptance testing and with newly installed cables..." and cites references to conclude, "DC hi-pot testing before energizing new medium-voltage cable does not cause any reduction in cable life." Therefore, dc hipot testing will continue to be listed, however the reference shall be changed to that of IEEE 400, IEEE 1242 and IEEE 3007.2.
Technical	57	10.8.3	7	This reference is only for safety and the statement does not reflect	No	Recommended text from IEEE 1242: 1. For unshielded cables dc insulation resistance test should be used as an acceptance test. 2. Shielded cable systems including cable, joints, and termination insulation should be thoroughly tested in the factory using a 50 or 60Hz, elevated voltage, partial discharge test. Each cable system component must meet specific IEEE/IEC and IEEE partial discharge requirements. However, after shipping, handling, and installation, the cable system may no longer meet these requirements. Thus, an after-laying test is recommended. Ideally, the factory partial discharge test can be repeated on the installed	Revised	The clause discusses acceptance testing, and the first part of proposed item 2. refers to factory testing, which is not appropriate. The current IEEE 1242 (1999) was referred to and the proposed text was not substantiated. Further investigation in IEEE Std 3007.2 found, "DC hi-pot testing continues to be used for acceptance testing and with newly installed cables..." and cites references to conclude, "DC hi-pot testing before energizing new medium-voltage cable does not cause any reduction in cable life." Therefore, dc hipot testing will continue to be listed, however the reference shall be changed to that of IEEE 400, IEEE 1242 and IEEE 3007.2

Editorial	57	10.8.5	27	I do not see any mention of producing project Record Drawings for use in the ongoing operating and maintenance of the facility. Record Drawings are created from the contractor's annotated construction drawings.	No	consider adding creation of Record Drawings for ongoing operations.	Revised	Added, "The operation and maintenance manual should be supplemented by as-built record drawings of the substation. The as-built drawings are an important reference document for maintenance, troubleshooting, servicing, and future planning activities."
General	58	10.8.5.4	33	I would add also the equipment vendors as a good source of required spare part list	No		Revised	Revised a sentence to include a reference to the equipment supplier.
General	60	AnnexA	24	IEEE Std 510 is a withdrawn standard	No	Add footnote to bibliography that this standard is withdrawn, no longer active. Consider identifying other active standards to cite where IEEE 510 is		
Editorial				Draft meets all editorial requirements.	No		Accepted	