

Comments Received on draft Regulations after being uploaded on CEA website

Utility	Regulation No	Existing provisions	Suggestions	Justification
CAPE ELECTRIC	Chapter 5, Regulation no 41 (xiii)	neutral point of every generator and transformer shall be earthed by connecting it to the earthing system by not less than two separte and distinct connections and the connections shall be taken directly to ground electrodes without touching the frame.	neutral point of every generator and transformer shall be earthed by connecting it to the earthing system as per IS 3043	<p>With the existing wording, almost every generator Star point (Neutral) is separately earthed, even if the generators are in close vicinity. This is not correct for large buildings with multiple Generators synchronised. For generators less than 1000 volts, IS 3043 explains various methods as below.</p> <p>24.2 Low Voltage (Up to 1 000 V) Generators</p> <p>24.2.1 Earth Electrodes — The overall resistance to earth of the electrodes forming the connection to the general mass of earth from the low voltage energy source has to be consistent with the earth fault protection provided and shall be as low as possible.</p> <p>24.2.2 Single Low Voltage Generator Earthing (Synchronous Machines)</p> <p>24.2.2.1 Generator operating in isolation (from the mains or other supplies) — In this basic arrangement, the generator neutral point should be connected to the neutral of the low voltage switchgear which is itself connected through a bolted link (for test purposes) to an earthing conductor and the independent earth electrode.</p> <p>24.2.2.2 Standby generator (without paralleling facility) — In addition to the</p>

				<p>earthing requirements stated for a set operating in isolation from other supplies, special attention needs to be given to the change-over arrangement for standby set, which has to ensure that there can be no inadvertent parallel connection (see Fig. 28).</p> <p>In general four-pole changeover switching between the mains and standby, supplies should be used to provide isolation of the generator and electricity board neutral earths. However, in the case of a protective multiple earthing (PME) supply, three- or fourpole switching may be used. 24.2.2.3 Standby generator (capable of parallel operation with incoming mains supply) — Electricity boards will not generally permit continuous parallel operation of a synchronous machine with the low voltage mains supply, unless there are no other consumers on the network. However, short-term parallel operation for no-break load transfer or testing may be permitted. Also, if a synchronous machine output is rectified and connected through mains modulated static inverter continuous parallel operation will usually be permitted. In the latter case, the generator neutral terminal should be connected to the independent earth electrode and to any electricity board earth. For short-term parallel operation, giving no-break load transfer, the alternative</p>
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				<p>energy source earthing arrangements, which may be used, are as described in 23.2.3.1, except that only one generating set is involved.</p> <p>24.2.3 Multiple Low Voltage Generator Earthing (Synchronous Machines)</p> <p>24.2.3.1 Generator operating in isolation from other supplies — When low voltage generating sets are operated in parallel, the energy source earthing method is influenced by the magnitude of the circulating currents, particularly third harmonic, which can arise when generators are connected as four-wire machines. If the magnitude of the circulating current due to the nature of the load or the design of the generators is excessive when the neutrals are connected, then a neutral earthing transformer or star-point earthing switches are required.</p> <p>Hence, three alternative neutral earthing arrangements are possible for parallel operation as follows:</p> <p>a) All generator neutrals connected — With this arrangement, the neutral busbar in the main low voltage switchgear is connected through a bolted link to an earthing conductor and independent earth electrode.</p> <p>b) Neutral earthing transformer — By providing a neutral earthing transformer solidly connected to the busbars, the system neutral can remain earthed at all times</p>
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				paralleling facility, the changeover arrangement has to prevent inadvertent connection of the generator outputs and electricity board supply.
74	<p>Protection against lightning.- (1) The owner of every overhead line, sub-station or generating station which is exposed to lightning shall adopt efficient means for diverting to earth any electrical surges due to lightning which may result into injuries.</p> <p>(2) The earthing lead for any lightning arrester shall not pass through any iron or steel pipe, but shall be taken as directly as possible from the lightning arrester without touching any metal part to a separate nearest vertical ground electrode or junction of the earth mat already provided for the sub-station of voltage exceeding 650 V subject to the avoidance of bends wherever practicable.</p>	<p>Protection against lightning.- (1) The owner of every overhead line, sub-station or generating station which is exposed to lightning shall adopt efficient means for diverting to earth any electrical surges due to lightning which may result into injuries.</p> <p>(2) The earthing lead for any lightning arrester shall be connected to the structure and in addition shall not pass through any iron or steel pipe, but shall be taken as directly as possible from the lightning arrester without touching any metal part to a separate nearest vertical ground electrode or junction of the earth mat already provided for the sub-station of voltage exceeding 650 V subject to the avoidance of bends wherever practicable.</p> <p>Note: This is not the correct solution, but some improvement form the existing.</p>	<p>Reason: Purpose of LA is to reduce the voltage stress in the Transformer/switchgear and divert lightning current. Please have a look at the explanation form IEEE 142 on the subject.</p> <p>2.2.7 Grounding Connections Associated with Steep Wave Front Voltage Protection Equipment.</p> <p>The application of surge arresters to transformers (see Fig 34) and surge protective capacitors and arrestors to rotating machines (see Fig 35) illustrate this application of a grounding conductor. The function of the grounding conductor is to provide a conducting path over which the surge current can be diverted around the apparatus being protected, without developing a dangerous voltage magnitude. In the presence of a changing current (di/dt) there will be an inductive voltage drop developed along the grounding conductor itself, which is additive to the protective device voltage. The amount of this added voltage will be proportional to the conductor length and the spacing from the protected apparatus and of course to the magnitude of di/dt.</p>	

				<p>Actual values of di/dt range over wide limits, but a value of 10 kA/μs is representative. With such a rate of rise of current, even 1 μH of inductance can be significant. $E = L \cdot di/dt = 10^{-6} \cdot 100000 \cdot 106 = 10000v$</p> <p>NOTE: 1 μH is the equivalent of 0.000377 R reactance at 60 Hz.</p> <p>Comments/suggestions on CEA safety regulation by S. Gopakumar Ref: CEI/1/2/regulation/2016/1829 dt 29 november 2016 gopa0904@gmail.com</p> <p>It would take only a 3 ft (0.91 m) length of AWG 410 (107.16 mm²) conductor spaced 5 ft (1.52 m) away from the transformer in Fig 34 to add 10000 V to the arrester voltage. Thus, grounding conductor length and spacing become of paramount importance. One can readily visualize that the additive inductive voltage is generated by the total flux linkages that can be developed through the window between the grounding conductor and the protected apparatus.</p> <p>To take full advantage of the protective properties of the surge arrester in Fig 34, the arrester should be mounted so as to be in direct shunt relationship to the terminal bushings. At lower voltages an arrester supporting bracket can usually be extended from the base of the bushing. At higher voltages a shelf extending from the tank</p>
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				drop in machine terminal voltage when the arrester sparks over.
CEI TELAN GANA	12 (5)	Owner of shall display conspicuously a Single Line Diagram of every electrical installation belonging to him.	Owner of Installation shall display conspicuously a Single Line Diagram approved by Electrical Inspector under Regulation 43 of every electrical installation belonging to him.	Only approved drawings shall be taken as reference to avoid ambiguity.
	43	Approval by Electrical Inspector and self-certification. – (1) Every electrical installation of notified voltage and below shall be inspected, tested and shall be self-certified by the owner or supplier or consumer, as the case may be, of the installation before commencement of supply or recommencement after shutdown for six months and above for ensuring observance of safety measures specified under these regulations and such owner or supplier or consumer shall submit the report of self-certification in the Form-I or Form-II or Form-III, as the case may be, of Schedule-IV to the Electrical Inspector.	Approval by Electrical Inspector and self-certification. – (1) Every electrical installation of notified voltage and below shall be inspected, tested “by the Electrical Inspector (or) Chartered Electrical Safety Engineer as the case may be” the installation before commencement of supply or recommencement after shutdown for six months and above for ensuring observance of safety measures specified under these regulations. The owner or supplier or consumer shall submit the report of self-certification “along with” Form-IV (to be Proposed) of Schedule-IV to the Electrical Inspector.	As the owner may not be qualified to test Electrical Installation himself. The Installation to be tested by Electrical Inspector or Chartered Electrical Safety Engineer. Hence words are modified. Forms I, II & III of Schedule-IV are specified for the regulation 30, i.e., periodical inspection of the existing installation,. In case of the the Regulation 43, for the inspection of new installations, a separate form to be proposed incorporating all the provisions of the Act and Regulations for new installations

	43 (1)(b)	Every Electrical Installation maps, plans and sections design approval in the form of drawings shall be obtained from the Electrical Inspector.	1) To ensure the installation is designed as per technical standards and as per regulation and relevant codes in vogue.2) The drawing approval will be the reference to the contractors to execute the work as per standards . 3) For new installation to be inspected by the Chartered Electrical safety Engineer for the purpose of self certification has to have some reference in respect of installation. This will be in the form of drawings, design approved by Electrical Inspector. 4) To comply the Section 53 (f) of the Electricity Act, 2003. 5) The Electrical Inspector after receipt of the self certification from the supplier or owner or Chartered Electrical Safety Engineer of the Electrical Installation, the drawing approval will be the reference for recording variations, if any, in accordance with these Regulations to rectify variations.	This shall be the be more beneficial to the owners of the installation as the installation will be erected as per the design approval
CAIRN INDIA	Chapter 1 2 Definitions	Numbering	Correction as in remarks.	In between (zu) and (zw) zv is missing leading to change in numbering.
	Chapter 1 2. Definitions zzi	“Touch voltage” means the potential difference between a grounded metallic structure and a point on the earth’s surface separated by a distance equal to	<u>Touch voltage</u> : The potential difference between the ground potential rise (GPR) and the surface potential at the point where a person is standing while at the same time	The definition may be made in line with IEEE Std 80; may be changed.

		the normal maximum horizontal reach, approximately one meter.	having a hand in contact with a grounded structure.	
	Chapter 1 2. Definitions zzn	Definition statement is not available	ABC are overhead power lines using several insulated phase conductors bundled tightly together, usually with a bare neutral conductor.	The ABC definition may be given. The following definition may be considered.
	Chapter 2 5 A 3	The Central Electricity Authority shall, within a period of one year, frame and issue the guidelines along with the eligibility conditions for authorizing the Chartered Electrical Safety Engineer.	Suggested Note: The Central Electricity Authority shall frame and issue the guidelines along with the eligibility conditions for authorizing the Chartered Electrical Safety Engineer by xx-xx-2017.	This action point may be mentioned as a note and the suggested text may be considered for the same.
	Chapter 3 31	Testing of consumer's installation. - (1) Upon receipt of an application for a new or additional supply of electricity and before connecting the supply or reconnecting the same after commencement of supply or recommencement of supply after the supply has been disconnected for a period of six months, the supplier (electrical power supplying company) shall either test the installation himself or accept the test results submitted by the consumer when same has been duly signed by the licensed	Testing of consumer's installation. - (1) Upon receipt of an application for a new or additional supply of electricity and before commencement of supply or recommencement of supply after the supply has been disconnected for a period of six months, the supplier (electrical power supplying company) shall either test the installation himself or accept the test results submitted by the consumer when same has been duly signed by the licensed electrical contractor for up to voltage of 650V.	The text in red (and above 650V the same shall be tested & signed by the Government authorized or NABL Accredited Electrical Testing Laboratory) is not in the existing regulations. Hope this is a deletion from initial draft during the course of present revision.

		electrical contractor for up to voltage of 650V, and above 650V the same shall be tested & signed by the Government authorized or NABL Accredited Electrical Testing Laboratory.		
	Chapter 9 102.4	Provided that in fixed plants on surface of the mines or opencast mines, the said voltage for the remote control or electric interlocking may be permitted up to 250 V.	Provided that in fixed plants on surface of the mines, oil field or opencast mines, the said voltage for the remote control or electric interlocking may be permitted up to 250 V.	“Oil mines” may be included
	Chapter 9 115	Training for supervisor and Electricians	May be corrected as appropriate.	The training is mentioned in guide lines separately under “Guidelines for determining adequacy of designated supervisors on duty in every mine or oil-field while electricity is being used” In the Reg 115 the cross ref for training is given as Reg 116. May be corrected. (116 in the draft is for Miscellaneous aspects under Chapter 10.)
	General Few regulations	As per relevant Indian Standards	The relevant specific standards may be specified in a separate annexure for wider reference.	
CEI KERAL A	Regulation 2	Definitions	Definitions. - In the Central Electricity Authority (Measures relating to Safety and Electric Supply) Amendment Regulations, 2015 following clauses are included	Regulations 30 and 43 are redefined based on these three terminologies. Hence the suggestion. Regulation

			but in the new draft it is seen omitted. 1. Chartered Electrical Safety Engineer. 2. Electrical Inspector of Mines. 3. Flame proof enclosure. 4. Inspecting Officer. 5. Intrinsically safe apparatus. 6. Notified voltage. 7. Self certification. Among these, the terminologies mentioned in items 1,6 and 7 are newly introduced in the earlier amendments and may be retained in the upcoming amendments.	
	Regulation 5A	<p>Chartered Electrical Safety Engineer.-(1)The Appropriate Government may authorise Chartered Electrical Safety Engineers amongst persons having the qualification and experience as specified in sub-regulation (2) of regulation 5 to assist the owner or supplier or consumer of electrical installations for the purpose of self-certification under regulation 30 and regulation 43.</p> <p>(2) The Appropriate Government shall upload the name of the chartered Electrical Safety</p>	Chartered Electrical Safety Engineer. -The Appropriate Government may authorise Electrical Safety Engineers having the qualification and experience as specified in sub-regulation (2) of regulation 5 or having experience in administration of Electricity Act, Rules and Regulations to assist the owner or supplier or consumer of electrical installations for the purpose of self-certification under regulation 30 and regulation 43. Provided he shall carry out the tests as specified in the sub-regulation(3) of regulation 5	The persons having experience in administration of Electricity Act, Rules and Regulations are more competent to implement the provisions of the regulations.

		<p>Engineer, as soon as a person is authorized as Chartered Electrical Safety Engineer, on the web portal of the Government or Department dealing with matters of inspection of electrical installations for the information of the owner or supplier or consumer.</p> <p>(3) The Central Electricity Authority shall, within a period of one year, frame and issue the guidelines alongwith the eligibility conditions for authorizing the Chartered Electrical Safety Engineer.</p>		
	Regulation 6(1)	<p>Engineers and supervisors engaged or appointed to operate or undertake maintenance of any part or whole of a thermal power generating station and a hydro power plant an electric power plant together with the associated sub-station shall hold degree or diploma in Engineering from a recognized institute or university.</p>	<p>Safety measures for operation and maintenance of electric plants.- Engineers and supervisors engaged or appointed to operate or undertake maintenance of any part or whole of an electric power plant together with the associated sub-station shall hold degree or diploma in Electrical Engineering from a recognized institute or university.</p>	<p>The engineering branch may be related to the work concerned, i.e., preferably Electrical Engineering. Also, it may be noted that this will be against the provisions in Regulation 5 regarding the qualification. Hence the amendment</p>

Regulation 7(1)	Engineers or supervisors engaged or appointed in operation and maintenance to operate or undertake maintenance of transmission and distribution systems shall hold degree or diploma in electrical, mechanical, electronics and instrumentation Engineering from a recognized institute or university.	Safety measures for operation and maintenance of transmission, distribution systems.- Engineers or supervisors engaged or appointed to operate or undertake maintenance of transmission and distribution systems shall hold degree or diploma in electrical, mechanical, electronics and instrumentation Engineering from a recognized institute or university	Mechanical and Electronics branches may be omitted as electrical safety cannot be ensured by engineers from other branches. Also, it may be noted that this will be against the provisions in Regulation 5 regarding the qualification. Hence the amendment.
Regulation 13(4)	(4) The consumer shall also ensure that the installation under his control is maintained in a safe condition.	Service lines and apparatus on consumer's premises.- The consumer shall also ensure that the installation under his control is maintained in a safe condition. (is seen omitted)	The consumer may also responsible for maintaining electrical installation under his control in safe condition. Accidents may occur in consumer premises due to the negligence in maintaining electrical installations in safe condition. Hence the suggestion.
Regulation 16(4)	(4) Save as otherwise provided in these regulations, TN system of earthing as per IS 732 shall be followed by the Supplier to carry out the purpose of this regulation.	Earthed terminal on consumers' premises.- Save otherwise provided in these regulations, TN system of earthing as per IS 732 and IS 3043 shall be followed by the supplier to carry out the purpose of this regulation.	TN System is mentioned in IS 3043. Hence the amendment.
Regulation 19 (3-i)	No person shall operate and undertake maintenance work on any part or whole of an electric power plant together with the associated substation or electric supply line or apparatus and no person shall assist such person on	Handling of electric supply lines and apparatus.- No person shall operate and undertake maintenance work on any part or whole of an electric power plant together with the associated substation or electric supply line or apparatus and no	Regulation 29 may also include since this modification required when workers are engaged for works. Hence the amendment

		such work, unless he is designated in that behalf under regulation 3(1) or engaged or appointed under regulation 6(1) or regulation 7(1), and takes the safety precautions given in Part-II, Part-III and Part-IV of Schedule-III.	person shall assist such person on such work, unless he is designated in that behalf under regulation 3(1) or appointed under regulation 6(1) or regulation 7(1), Regulation 29 and takes the safety precautions given in Part-II, Part-III and Part-IV of Schedule-III.	
	Regulation 26(2)	Where alternating current and direct current circuits are installed on the same box or support, they shall be so arranged and protected that they shall not come into contact with each other when live.	Accidental charging.- Where alternating current and direct current circuits are installed on the same box or support, they shall be so arranged and protected that they shall not come into contact with each other when live and in such case unearthed direct current system shall be used.	When direct current also connected to earth terminal there is a chance for contacting direct current with alternating current. Hence the amendment.
	Regulation 27(7)	Address and telephone number of the nearest Doctor, hospital with a facility for first-aid treatment for electric shock and burns, ambulance service shall be prominently displayed near the electric shock treatment chart in control room and operator cabin	Provisions applicable to protective equipments.- Address and telephone number of the nearest Doctor, hospital with a facility for first-aid treatment for shock and burns, ambulance service and fire service shall be prominently displayed near the electric shock treatment chart in control room and operator cabin.	Fire service is also essential. Hence the amendment.
	Regulation 29	Precautions to be adopted by consumers, owners, occupiers, electrical contractors, electrical	Penal provision for controlling unauthorised electrical work may also be included.	

		<p>workmen and suppliers.- (1) No electrical installation work, including additions, alterations, repairs and adjustments to existing installations, except such replacement of lamps, fans, fuses, switches, domestic appliances of voltage not exceeding 250V and fittings as in no way alters its capacity or character, shall be carried out upon the premises of or on behalf of any consumer, supplier, owner or occupier for the purpose of supply to such consumer, supplier, owner or occupier except by an electrical contractor licensed in this behalf by the State Government and under the direct supervision of a person holding a certificate of competency and by a person holding a permit issued or recognised by the State Government.</p> <p>Provided that in the case of works executed for or on behalf of the Central Government and in the case of installations in mines, oil fields and railways, the Central Government and in other cases</p>		
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		<p>the State Government, may, by notification in the Official Gazette, exempt on such conditions as it may impose, any such work described therein either generally or in the case of any specified class of consumers, suppliers, owners or occupiers.</p> <p>(2) No electrical installation work which has been carried out in contravention of sub-regulation (1) shall either be energised or connected to the works of any supplier.</p>		
	Regulation 30(2)	<p>(2) The periodical inspection and testing of installation of voltage equal to or below the notified voltage belonging to the supplier or consumer shall be carried out by the supplier or owner or consumer and shall be self-certified.</p>	<p>Periodical inspection and testing of installations.- The periodical inspection and testing of installation of voltage equal to or below the notified voltage belonging to the owner or supplier or consumer, as the case may be, shall be get carried out by Chartered Electrical Safety Engineer and shall be self-certified by the owner or supplier or consumer, as the case may be, for ensuring observance of safety measures specified under these regulations and the owner or supplier or consumer, as the case may be, shall submit the report of</p>	<p>As the consumer or owner of an installation is not a qualified person it cannot inspect or test his electrical installation. If he is permitted to do so it will be against the provisions under regulation 29. Hence the amendment.</p>

			self-certification in the Form-I or Form-II or Form-III, as the case may be, of Schedule-IV to the Electrical Inspector.	
	Regulation 35(2)(ii) and 35(2)(iii)	<p>(ii) a linked switch with fuse or a circuit breaker by a consumer of voltage exceeding 650V but not exceeding 33 kV having aggregate installed transformer or apparatus capacity up to 1000 KVA 500 kVA to be supplied at voltage upto 11 kV and 2500 KVA 1250 kVA at higher voltages (above 11 kV and not exceeding 33 kV);</p> <p>(iii)a circuit breaker by consumers at voltage exceeding 650 V but not exceeding 33 kV having an aggregate installed transformer and or apparatus capacity above 1000 KVA 500 kVA to be supplied at voltage upto 11 kV and 2500 KVA 1250 kVA at higher voltages (above 11 kV and not exceeding 33 kV);</p>	Regulation 35(2)(ii) and 35(2)(iii) are seems to be the same. Hence the suggestion.	
	Regulation 35(3)(i)(b)	(b) having a capacity 1000 KVA and above installed in or after the year 2000, a circuit breaker shall be provided:	having a capacity 500kVA and above installed in or after the year 2000, a circuit breaker shall be provided.	This regulation may be in line with regulation 35(2)(ii). Hence the amendment.

		<p>Provided also that the linked switch with fuse or circuit breaker on the primary side of the transformer shall not be required for the unit auxiliary transformer and generator transformer;</p>		
	Regulation 37	<p>Conditions applicable to installations of voltage exceeding 250 Volts.- The following conditions shall be complied with where electricity of voltage above 250 V is supplied, converted, transformed or used; namely:-</p> <p>(i) all conductors, other than those of overhead lines, shall be completely enclosed in mechanically strong metal casing or metallic covering which is electrically and mechanically continuous and adequately protected against mechanical damage unless the said conductors are accessible only to an a designated person or are installed and protected so as to prevent danger:</p> <p>Provided that non-metallic conduits conforming to the relevant Indian Standard</p>	<p>Conditions applicable to installations of voltage exceeding 250 Volts.- The following conditions shall be complied with where electricity of voltage above 250 V is supplied, converted, transformed, inverted or used; namely:-</p>	<p>In many LT premises inverters used and this modifications is required for solar installations. Hence the amendment.</p>

	<p>Specifications may be used for installations of voltage not exceeding 650 V;</p> <p>(ii) all metal works, enclosing, supporting or associated with the installation, other than that designed to serve as a conductor shall be connected with an earthing system as per standards laid down in the Indian Standards in this regard and the provisions of regulation 41.</p> <p>(iii) Every switchboard shall comply with the following,-</p> <p>(a) a clear space of not less than one metre in width shall be provided in front of the switchboard;</p> <p>(b) if there are any attachments or bare connections at the back of the switchboard, the space, if any, behind the switchboard shall be either less than twenty centimetres or more than seventy five centimetres in width, measured from the farthest protruding part of any attachment or conductor;</p>		
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	<p>(c) if the space behind the switchboard exceeds seventy five centimetres in width, there shall be a passage way from either end of the switchboard, clear to a height of 1.8 metres.</p> <p>(iv) In case of installations provided in premises where inflammable materials including gases and chemicals are produced, handled or stored, the electrical installations, equipment and apparatus shall comply with the requirements of flame proof, dust tight, totally enclosed or any other suitable type of electrical fittings depending upon the hazardous zones as per the relevant Indian Standard Specifications.</p> <p>(v) Where an application has been made to a supplier for supply of electricity to any installation, he shall not commence the supply or where the supply has been discontinued for a period of six months and above, recommence the supply unless the consumer has complied with, in all respects the</p>		
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		<p>conditions of supply set out in these regulations.</p> <p>(vi)Where a supplier proposes to supply or use electricity at or to recommence supply of voltage exceeding 250 V but not exceeding 650 V after it has been discontinued for a period of six months, he shall, before connecting or reconnecting the supply, give notice in writing of such intention to the Electrical Inspector.</p> <p>(vii)If at any time after connecting the supply, the supplier is satisfied that any provision of these regulations are not being observed he shall give notice of the same in writing to the consumer and the Electrical Inspector, specifying how the provisions have not been observed and to rectify such defects in a reasonable time and if the consumer fails to rectify such defects pointed out, he may discontinue the supply after giving the consumer a reasonable opportunity of being heard and recording reasons in writing and</p>		
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		the supply shall be discontinued only on written orders of an officer duly notified by the supplier in this behalf and shall be restored with all possible speed after such defects are rectified by the consumer to the satisfaction of the supplier.		
	Regulation 37(iii) (a)	(a) a clear space of not less than one metre in width shall be provided in front of the switchboard;	a clear space of not less than 1m in width shall be provided in front of switch board after racked out the breaker, if any;	1m clearance is not sufficient for free movement of maintenance personal after racked out the breaker. Hence the amendment.
	Regulation 42	Earth leakage protective device. - The supply of electricity to every electrical installation other than voltage not exceeding 250 V, below 2 kW 1 kW and those installations of voltage not exceeding 250V, which do not attract provisions of section 54 of the Act, shall be controlled by an earth leakage protective device whose maximum earth leakage threshold for tripping should not exceed 30 milliamps for domestic connections and 100 milliamps for all other installations, so as to disconnect the supply instantly on the	Earth leakage protective device.- The supply of electricity to every electrical installations other than voltage not exceeding 250 V and those installations of voltage not exceeding 250V, which do not attract provisions of section 54 of the Act, shall be controlled by an earth leakage protective device whose maximum earth leakage threshold for tripping should not exceed 30 milliamps for domestic connections and 100 milliamps for all other installations, so as to disconnect the supply instantly on the occurrence of earth fault or leakage of current	This may be applicable to all electrical installations irrespective of connected load since in domestic premises the rate of accidents is increased drastically. Hence the amendment.

		<p>occurrence of earth fault or leakage of current:</p> <p>Provided that such earth leakage protective device shall not be required for overhead supply lines having protective devices which are effectively bonded to the neutral of supply transformers and conforming to regulation 73.</p>		
	Regulation 43(1)	<p>(1) Every electrical installation of notified voltage and below shall be inspected, tested and shall be self-certified by the owner or supplier or consumer, as the case may be, of the installation before commencement of supply or recommencement after shutdown for six months and above for ensuring observance of safety measures specified under these regulations and such owner or supplier or consumer shall submit the report of self-certification in the Form-I or Form-II or Form-III, as the case</p>	<p>Approval by Electrical Inspector and selfcertification.- Every electrical installation of notified voltage and below shall be inspected and tested by the Chartered Electrical Safety Engineer and shall be self-certified by the owner or supplier or consumer, as the case may be, of the installation before commencement of supply or recommencement after shut down for six months and above for ensuring observance of safety measures specified under these regulations and such owner or supplier or consumer shall submit the report of self-certification in the Form-III of ScheduleIV to the Electrical Inspector.</p>	<p>As the consumer or owner of an installation is not a qualified person it cannot inspect or test his electrical installation. If he is permitted to do so it will be against the provisions under regulation 29. Hence the amendment.</p>

		<p>may be, of Schedule-IV to the Electrical Inspector.</p> <p>Provided that the owner or supplier or consumer has the option to get his installation inspected and tested by the Electrical Inspector of the Appropriate Government.</p> <p>Provided further that every electrical installation covered under section 54 of the Act including every electrical installations of mines, oil fields and railways shall be inspected and tested by the Electrical Inspector of the Appropriate Government as specified in sub-regulation (3).</p>		
	Regulation 43(4)(i)	(4-i) The Electrical Inspector in case of variations which require rectification, direct the owner or supplier or consumer to rectify the same within a period of 30 days from the date of recording of the variations.	The Electrical Inspector in case of variations which require rectifications, direct the owner or supplier or consumer to rectify the same within a period of 30 days from the date of recording of the variations. In the event of the failure of the owner or supplier or consumer	This may be included in this regulation to maintain the installation safely in accordance with the regulation 13(4). Hence regulation 13(4) is also essential. Hence the amendment.

			of any installation to rectify the defect in his installation pointed out by the Electrical Inspector in his report, such installation shall be liable to be disconnected under the directions of the Electrical Inspector after serving the owner of such installations with a notice for a period not less than 15 days.	
	Regulation 45(2)(iv)	(iv) transformers of capacity 10 MVA and above shall be protected against incipient faults by differential protection	Inter-locks and protection for use of electricity at voltage exceeding 650 Volts.- transformers of capacity 5 MVA and above shall be protected against faults by differential protection;	Considering the cost of equipments, this may be considered. Hence the amendment.
	Regulation 45(2)(v)	(v) all generators with rating of 100 KVA and above shall be protected against earth fault or leakage;	all transformers and generators with rating of 100kVA and above shall be protected against earth fault or leakage.	Transformers also may be protected against earth fault or leakage. Hence the amendment.
	Regulation 45(2)(vi)	(vi) all generators of rating 1000 KVA and above shall be protected against faults within the generator winding using restricted earth fault protection or differential protection or by both;	all transformers and generators of rating 1000kVA and above shall be protected against faults within the winding using restricted earth fault protection or differential protection or by both;	Transformers having capacity of 1000kVA and above may be protected against faults within the winding. Hence the amendment.
	Regulation 58(4)	(4) For lines of voltage exceeding 33 kV but not exceeding 400 kV and having the voltage other than nominal voltage, the clearance above	Clearance in air of the lowest conductor of overhead lines.- For lines of voltage exceeding 33kV but not exceeding 400kV and having the voltage other than nominal voltage,	This regulation may be retained, since the provision for clearance of lines exceeding 33kV is not mentioned. Hence the amendment.

		<p>ground shall not be less than 5.2 metres plus 0.3 metre for every 33,000 Volts 33 kV or part thereof by which the voltage of the line exceeds 33,000 Volts 33 kV;</p> <p>Provided that the minimum clearance along or across any street shall not be less than 6.1 metres.</p>	<p>the clearance above ground shall not be less than 5.2 metres plus 0.3 metre for every 33kV or part thereof by which the voltage of the line exceeds 33kV;</p> <p>Provided that the minimum clearance along or across any street shall not be less than 6.1metres.</p>	
	Regulation 64(i)	<p>(1) No rods, pipes or similar materials shall be taken below, or in the vicinity of, any bare overhead conductors or lines if these contravene the provisions of regulations 60 and 61 unless such materials are transported under the direct supervision of a person designated designated under regulation 3(1) or engaged or appointed under regulation 6(1) or regulation 7(1) in that behalf by the owner of such overhead conductors or lines.</p>	<p>Transporting and storing of material near overhead lines.- (1) No rods, pipes or similar materials shall be taken below, or in the vicinity of, any bare overhead conductors or lines if these contravene the provisions of regulations 60 and 61 unless such materials are transported under the direct supervision of a person designated designated under regulation 3(1) or engaged or appointed under regulation 6(1) or regulation 7(1) in that behalf by the owner of such overhead conductors or lines.</p>	<p>This may be omitted. Since "designated" is seen repeated</p>
	Regulation 65(3)	<p>(3) No cutting of soil within ten meters from the tower structure of 132 kV and above voltage level shall be permitted without</p>	<p>General Clearances.- No cutting of soil within ten meters from the tower structure of 132kV and above voltage level shall be permitted</p>	<p>Minimum distance to be maintained to any construction from the poles and from the towers or any supporting posts or electric overhead lines may be included. The voltage level may be 250V, 440V, 11kV,</p>

		the written permission of the owner of tower structure.	without the written permission of the owner of tower structure	33kV, 66kV, 110kV, 220kV, 400kV etc. Hence the suggestion.
	Chapter XIII	Additional safety requirements for solar park installations	<p>Following points may be added with general safety requirements-</p> <ol style="list-style-type: none"> 1. The transformers used for solar installations shall be of inverter duty type and transformers of capacity 1000kVA and above having unearthed winding shall be protected against incipient faults by differential protection. (Earth fault or leakage protection cannot be provided if the transformer windings are unearthed. Hence the suggestion) 2. Earth resistance shall not be more than 5ohms. It may be ensured that all the earth connections are bonded together to make them at the same potential. 3. The earthing conductor may be rated for the maximum short circuit current and may be 1.56 times the short circuit current. The area of cross section may not be less than 1.6 Sq.mm. in any case. 4. Earthing may be done in accordance with IS 3043/1987, provided that earthing conductors may have a minimum size of 6 Sq.mm. Copper, 10 Sq.mm. 	

			Aluminium or 70 Sq.mm. hot dip galvanised steel.	
			<p>From the point of fire safety in multi storied buildings where solar PV modules are installed, even if the provisions of regulation 36 are complied with, the DC cable and solar system may be in live condition. Precautionary measures may be insisted in such cases. Hence the following suggestions-</p> <ol style="list-style-type: none"> 1. Combiner or grid tied inverter unit of capacity 10kW and above shall be installed in the periphery of the building. 2. The DC cable from solar PV panel or grid tied inverter unit shall be laid through the outer wall of the building and DC cables should be installed to provide as short runs as possible. 3. Solar system shall be tied at a point immediately after the meeting point through a divider panel. 4. Where the building on which solar PV system is installed becomes the tallest structure in the vicinity, lightning protection as per IS shall be provide. 	
JOHNS ON CONT	16(1)	The supplier shall provide and maintain on the consumer's premises for the consumer's use,	provided that in case of installation of voltage exceeding 250 V the consumer shall, in addition to the	Reason - This change is to comply Regulation 16(4). If not linked with the

<p>RACT ORS</p>		<p>a suitable earthed terminal in an accessible position at or near the point of commencement of supply.</p> <p>Provided that in the case of installation of voltage exceeding 250 V the consumer shall, in addition to the aforementioned earthing arrangement, provide his own earthing system with an independent electrode.</p> <p>Provided further that the supplier may not provide any earthed terminal in the case of installations already connected to his system on or before the date to be specified by the State Government in this behalf if he is satisfied that the consumer's earthing arrangement is efficient.</p>	<p>aforementioned earthing arrangement, provide his own earthing system with an independent electrode <u>and shall be linked with the suppliers earth terminal.</u></p>	<p>suppliers' terminal, that system will become TT system of earthing</p>
	<p>29(1)</p>	<p>No electrical installation work, including additions, alterations, repairs and adjustments to existing installations, except such replacement of lamps, fans, fuses, switches, domestic appliances of voltage not exceeding 250V and fittings as in</p>	<p>...by the state Government. <u>A work completion report and test report fulfilling section 3 of IS 3043 shall be submitted to the supplier along with all necessary electrical schemes and installation lay out duly signed by the licensed electrical contractor with the owner</u></p>	<p>Reason – To put an end to the unauthorized electrical installation practice and connected electrical accidents/deaths and corruption generated by non-licensed electrical contractors</p>

		<p>no way alters its capacity or character, shall be carried out upon the premises of or on behalf of any consumer, supplier, owner or occupier for the purpose of supply to such consumer, supplier, owner or occupier except by an electrical contractor licensed in this behalf by the State Government and under the direct supervision of a person holding a certificate of competency and by a person holding a permit issued or recognised by the State Government.</p> <p>Provided that in the case of works executed for or on behalf of the Central Government and in the case of installations in mines, oil fields and railways, the Central Government and in other cases the State Government, may, by notification in the Official Gazette, exempt on such conditions as it may impose, any such work described therein either generally or in the case of any specified class of consumers, suppliers, owners or occupiers.</p>	<p><u>for the energization of the installations</u></p>	
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31(1)	(1) Upon receipt of an application for a new or additional supply of electricity and before connecting the supply or reconnecting the same after commencement of supply or recommencement of supply after the supply has been disconnected for a period of six months, the supplier (electrical power supplying company) shall either test the installation himself or accept the test results submitted by the consumer when same has been duly signed by the licensed electrical contractor for upto voltage of 650V, and above 650V the same shall be tested & signed by the Government authorized or NABL Accredited Electrical Testing Laboratory.	..., and above 650V the same shall be tested & signed by the Government authorized or NABL accredited electrical testing laboratory <u>along with the licensed electrical contractor.</u>	Reason – To put an end to the unauthorized electrical installation practice and connected electrical accidents and corruption generated by non-licensed electrical contractors
41(xiii)	(xiii) neutral point of every generator and transformer shall be earthed by connecting it to the earthing system by not less than two separte and distinct connections and the connections shall be taken directly to ground electrodes without touching the frame.	neutral point of every generator and transformer shall be earthed by connecting it to the earthing system by not less than two separate and distinct connections without touching the frame <u>as given in IS 3043.</u>	Reason – to comply the details and sketches given in IS 3043 – clause 23.2.1

	Chapter XIII	<p>(9) PV modules shall be suitable for no less than 25 year of applications under the site conditions.</p> <p>(10) The silicon wafer thickness for crystalline silicon PV modules shall be no less than 180 micron.</p> <p>(11) The inverter shall be provided with maximum power point tracking (MPPT) function.</p> <p>(12) Grid inverter shall have no less than 98.6% efficiency.</p> <p>(13) SCADA system shall be provided to start or stop te grid inverter.</p> <p>(14) The solar tracker shall be installed to orient PV modules following the sun's elevation to maximise the power generation with tracking accuracy less than 2 degrees.</p>	Chapter XIII – General safety requirements – <u>(9), (10), (11), (12), (13) & (14) these clauses shall be quashed since these are not related to electrical safety.</u>	
DEHN INDIA	Chapter XIII	Additional safety requirements for solar park installatons	1.In Chapter X111: Since the combiner boxes are to operate at rated voltage of PV, it may be add that all combiner boxes shall be	

			<p>tested at rated voltage of PV. This is very basic point.</p> <p>2.In the same chapter in sub clause PROTECTION, TESTING and INTERLOCKING: you have asked for protection against DC ARCs. Please do mention that “SPD should have inbuilt facility apart from thermal disconnect, to extinguish DC arc over FULL IRRADIATION SPECTRUM till full short circuit current.</p> <p>3.IEC 62305 standards, as mentioned in your guidelines, further refer to EN 50539 part 11 and part 12 standards for SOLAR PV applications, which may be mentioned in the guidelines.</p> <p>4.In the clause “REQUIREMENT to PREVENT FIRE, please add point: All inverters and Lithium Batteries shall be equipped with INBUILT FIRE SUPPRESSION system, approved for the said application by independent agency.</p> <p>5.Also in the same clause, please mention Encapsulated (free from fire hazards) TYPE 1 SPD shall be</p>	
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			<p>used for AC and DC side with inbuilt Short Circuit limitation and interruption, and DC arc suppression over full solar irradiation curve apart from thermal switch/fuse.</p> <p>6. Some inverter manufacturers DO NOT ALLOW AC and DC earth to be connected together for proper operation of their inverters. In such cases, as mentioned in IEC 62305 standards, the two earths may be connected via isolating spark gaps tested for full lightning currents.</p> <p>7. Please also seek detailed design report of lightning protection scheme on the solar PV systems as this is most frequently happening safety issue at site apart from DC arc.</p>	
<p>Mr. V.M.Dave, EI, Govt . of Gujarat</p>	<p>Regulation 32</p>	<p>Installation and testing of generating units. - The capacity above which generating units including generating units producing electricity from renewable sources of energy will be required to be inspected by the Electrical Inspector before commissioning, shall be as per the notification issued by the</p>	<p>I would like to point out you that the Regulation No. 32. Installation and testing of generating units is grammatically not fit after deletion of some words.</p>	

		Appropriate Government under the sub-section (1) of section 162 of the Act.		
Mr. V.M.Dave EI, Govt. of Gujarat	Regulation 30(1)	Where an installation is already connected to the supply system of the supplier or trader, every such installation shall be periodically inspected and tested at intervals not exceeding five years either by the Electrical Inspector or by the supplier as may be directed by the State Government in this behalf or in the case of installations belonging to, or under the control of the Central Government, and in the case of installation in mines, oilfields and railways, by the Central Government.	In the draft of regulations, in Regulation 30(1) word Trader is used. Definition of Trader is not defined in Regulation No. 2 in draft of Regulations. As far as I know, definition of Trader must be included in the draft of Regulations	
	General		Definition of Notified Voltage - 2(zka) (Which finally agreed by the authority) is missed in the final draft.	
Mr.E.R. Premchandra	Reg 31(1)	Upon receipt of an application for a new or additional supply of electricity and before connecting the supply or reconnecting the same after commencement of	In this para after the words, licensed electrical contractor, the following may be substituted...	

<p>Former CEI, Kerala</p>		<p>supply or recommencement of supply after the supply has been disconnected for a period of six months, the supplier (electrical power supplying company) shall either test the installation himself or accept the test results submitted by the consumer when same has been duly signed by the licensed electrical contractor for upto voltage of 650V, and above 650V the same shall be tested & signed by the Government authorized or NABL Accredited Electrical Testing Laboratory.</p>	<p>...and self-certified by the consumer with the assistance of chartered electrical safety engineer, for up to and below the notified voltage, and above notified voltage the same shall be tested and certified by the Electrical Inspector.</p> <p>Note: This regulation can be clubbed with Regulation 43 since there are provisions for testing and approval of electrical installations of notified voltage and below, and above notified voltage.</p>	
	<p>Regulation 43</p>	<p>(1) Every electrical installation of notified voltage and below shall be inspected, tested and shall be self-certified by the owner or supplier or consumer, as the case may be, of the installation before commencement of supply or recommencement after shutdown for six months and above for ensuring observance of safety measures specified under these regulations and such owner or supplier or consumer shall submit the report of self-</p>	<p>As per the above regulation, the owner, supplier or consumer has to submit the report of self-certification in the Form III of schedule IV to the Electrical Inspector.</p> <p>It may please be noted that in the proposed regulation 30(2), for the periodical inspection and testing of installations of voltage equal to or below the notified voltage (installations of voltage exceeding 650 Volts) also, the owner or supplier or consumer shall submit the report of self-certification in</p>	

		<p>certification in the Form-I or Form-II or Form-III, as the case may be, of Schedule-IV to the Electrical Inspector.</p> <p>Provided that the owner or supplier or consumer has the option to get his installation inspected and tested by the Electrical Inspector of the Appropriate Government.</p> <p>Provided further that every electrical installation covered under section 54 of the Act including every electrical installations of mines, oil fields and railways shall be inspected and tested by the Electrical Inspector of the Appropriate Government as specified in sub-regulation (3).</p>	<p>Form III of schedule IV to the Electrical Inspector.</p> <p>In the case of Regulation 43, the commencement or recommencement after shut down for six months and above for ensuring observance of safety measures and hence it seems to be inadequate to report the self-certification in Form III of schedule IV. So I may suggest that the Form III of schedule IV and Form of schedule V may be combined for reporting the self-certification under Regulation 43.</p>	
GETC O	44.2.vii	where a substation or a switching station with apparatus having more than 2000 liters of oil is installed, whether outdoors or indoors, he shall take following measures	Where a substation or a Switching station with the apparatus having more than 2000 liters including K Class fluid is installed whether outdoors or indoors ,he shall take the following measures -	

	44.2.vii.b	b)provisions as per regulation 43(2)(a)(iii) of CEA (Technical Standards for Construction of Electric Plants and Electric Lines) Regulations shall be made for suitable oil soak pit and where use of more than 9000 liters of oil in any one oil tank, receptacle or chamber is involved, provision shall be made for draining away or removal of any oil which may leak or escape from tank,receptacle or chamber containing the same, and special precautions shall be taken to prevent the spread of any fire resulting from ignition of the oil from any cause and adequate provision shall be made for extinguishing any fire which may occur	b)provisions shall be made for suitable oil soak pit and where use of more than 9000 liters of O-class oil in any one oil tank, receptacle or chamber is involved, provision shall be made for draining away or removal of any oil which may leak or escape from tank, receptacle or chamber containing the same, and special precautions shall be taken to prevent the spread of any fire resulting from ignition of the oil from any cause and adequate provision shall be made for extinguishing any fire which may occur. In substations or a switching station with K-class fluid filled apparatus having more than 9000 liters of oil, station can be located in basement with simple arrangement for soak pit and drain system. Minimal fire extinguishing arrangements can be provided.	
	44.2.vii.d	d)all transformers and switchgears shall be maintained in accordance with the maintenance schedules prepared in accordance with relevant codes of practice of Bureau of Indian Standards	d)all transformers and switchgears shall be maintained in accordance with the maintenance schedules prepared in accordance with relevant codes of practice of Bureau of Indian Standards or relevant IEC /IEEE in the absence of IS	
	44.2.vii.e	e)dry type of transformers only shall be used for installations	dry type transformers or hermetically sealed K Class fluid	

		inside the residential and commercial buildings	filled transformers only shall be used for installations inside the residential and commercial buildings.	
	44.2.ix	he shall ensure that the transformers of 10 MVA and above rating are provided with fire fighting system as per IS - 3034: 1993 shall be provided with Automatic High Velocity Water Spray System designed and installed as per IS 15325 or with Nitrogen Injection Fire Protection system;	he shall ensure that the transformers of 10 MVA and above rating are provided with fire fighting system as per IS - 3034: 1993 shall be provided with Automatic High Velocity Water Spray System designed and installed as per IS 15325 or with Nitrogen Injection Fire Protection system except for transformers filled with K-class fluids;	
	44.2.x.g	oil filled transformers installed indoors in other than residential or commercial buildings are placed not below the first basement;	O-class oil filled transformers installed indoors in other than residential or commercial buildings are placed not below the first basement;	
	44.2.xi (a)	he shall ensure that oil filled transformers installed indoors in other than residential or commercial buildings are placed not above the ground floor	he shall ensure that O-class oil filled transformers installed indoors in other than residential or commercial buildings are placed not above the ground floor	
	44.2.xi (b)	he shall ensure that K-class oil filled transformer are placed not above the first floor of utility building provided the building structure is sufficiently strong;	he shall ensure that K-class oil filled transformer are placed provided the building structure is sufficiently strong;	
Mr. Manas Kundu,	Regulation 2	Various definitions as per last amendment notification	CEA should retain or make required inclusion of definition amendments notified in CEI 1/2/2015 dt	In the draft web hosted few of the definitions are absent for example 'Chartered Electrical

Copper Association		CEI/1/2/2015 dated 13th April 2015	13/04/2015 w.e.f 13/04/2015 in CEA Regs 2010.	Safety Engineer', "Notified Voltage", "Self Certification" etc
	Regulation 2	Definition on 'Notified Voltage' is absent	The definition should be introduced as well as CEA may specify above 33KV as notified Voltage as notified in State of Haryana, Maharashtra, Andhra Pradesh and Telagana.	As enabled under the Act, CEA as Authority should consider prescribing the "Notified Voltage" for harmonius development in the power sector of India.
	Regulation 3 (3)	No person shall be designated under sub-regulation (1) unless,- (i) he possesses a certificate of competency or electrical work permit, issued by the Appropriate Government.	Guidelines for designated person's to qualify as holder of certificate of competency or electrical work permit are not framed under Regln 3 (3) similar to guidelines framed under Reglns 115(1)	Issuance of such guidelines would bring in harmony and consistency of assigning competence to work permit holder in borderless India. Today though the appropriate Government stipulates that yet it becomes complex for the permit holder to migrate and work in another State. Besides State Instutions have their own instutional limitations that can be facilitated to overcome by such guidelines issued by the authority.
	Regulation 5 (2)	The Electrical Safety Officer shall be an Electrical Engineering degree holder with at least five years of experience in operation and maintenance of electrical installations or an Electrical Engineering diploma holder with at least 10 years of experience in operation and maintenance of electrical installations.	The expression "in operation and maintenance" may be changed as "In design and, or constrution and, or operation and, or maintenance and, or inspection and testing and commisioning" in Regns5(2). Formulation is The Electrical Safety Officer shall be an Electrical Engineering degree holder with at least five years of experience " In design and, or constrution and, or operation and, or maintenance and, or inspection and testing and	Based on recall of various discussion during Committee meeting it is proposed since it will help making available a pool of qualified personnel for the purpose and objective of this regulation

			commisioning" of electrical installations or an Electrical Engineering diploma holder with at least 10 years of experience in operation and maintenance of electrical installations.	
	Schedule 2	Schedule 2 current draft does not contain specialized syllabus for Electrical Safety Officer (S) Designated for Electrical installations for factory above 250kW connected load and other industrial, commercial, non-commercial, office, non-office, educational colleges universities, permanent exhibition buildings multi-speciality hospital complexes, Aerodromes, consumer electrical distribution system	Please consider incorporation of such syllabus	Standardised framework will ensure training and capacity bulidng of professionals at least in basic minimum framework. IS 732 may please be referred in this connection as well.
	Regulation 12 (2)	Save as otherwise provided further in these regulations, the relevant Indian Standards or National Electrical Code or International Standard, if any, may be followed to carry out the purposes of this regulation and in the event of any inconsistency, the provisions of these regulations shall prevail.	The word 'may ' should be replaced with word "shall". Save as otherwise provided further in these regulations, the relevant Indian Standards or National Electrical Code of India or International Standard, if any, may shall be followed to carry out the purposes of this regulation and in the event of any inconsistency, the provisions of these regulations shall prevail.	Regulations are sub legislation of the ACT provisions and have statutory power associated. Similary national Codes and Standards are developed for asssting better observation of legal provision in place. The word "may" often gives leeway at the field level to some of the stakeholders not observing the good practices and standards citing absence of mandatory nature of the regulation.This tendency would be curtailed. Furher it was discussed during

				Committee deliberations and agreed for suggested change
	Chapter on SAFETY REQUIREMENTS FOR ELECTRIC TRACTION NOT FOUND		Please consider incorporation of chapter in ensuing public process	
	Form 1, 2, 3 in Schedule 4 not found		Please incorporate ..	Oversight may be the reason that may be corrected please.
Mr. H.Dilip Kumar, Former CEI, Kerala	12(2)	(2) Save as otherwise provided further in these regulations, the relevant Indian Standards or National Electrical Code or International Standard, if any, may be followed to carry out the purposes of this regulation and in the event of any inconsistency, the provisions of these regulations shall prevail.	or IEC standard if Indian Standard is not available	The regulation 12 is applicable to all electrical installations other than plants and lines. This is the only regulation giving mandatory status to follow any code of practice which is normally voluntary only. The code of practice may be continued as BIS since the IEC or International standards are inaccessible to common man. The code of practice involving safety aspects has to be available to common man. In very special cases of high voltage line construction the IEC can also be followed. There is no other provision in the prevailing regulation making code of practice as mandatory for any type of electrical installation other than Reg12. The express provision as the existing one is required to give mandatory status to code of practice or standards whether Indian or IEC. All the

				codes and standards are voluntary as per BIS Act, 1986. The proposed amendment will give a serious impact on the areas of installations handled by common man and of course of voltage below 650V where the safety is a serious concern.
	13(4)	(4) The consumer shall also ensure that the installation under his control is maintained in a safe condition.	The deletion may be cancelled and existing provision continued	The existing provision may be retained as this is the only express provision in the Regulations giving responsibility on the consumer to keep his installation in a safe manner.
	16(4)	(4) Save as otherwise provided in these regulations, TN system of earthing as per IS 732 shall be followed by the Supplier to carry out the purpose of this regulation.	The addition needs modification	This regulation warrants TN system for distribution where as mostly TT system is being followed in LT distribution.. The safety is achieved in TT system by virtue of Reg42 earth leakage circuit breaker. The supplier shall be given freedom to select the system as both are as per IS732. This regulation may be made mandatory if TN system is followed.
	31	Testing of consumer's installation. - (1) Upon receipt of an application for a new or additional supply of electricity and before connecting the supply or reconnecting the same after commencement of supply or recommencement of supply after the supply has been disconnected for a period of six months, the	The addition needs modification	The installations above 650V being inspected by the Electrical Inspector have to be exempted from testing by Government authorized or NABL Laboratories, because Reg43 empowers the Electrical Inspector to issue approval in writing after conducting testing and inspection. So this will contradict the Reg43 and being the succeeding regulation Reg43 will over ride the new addition in Reg31. So the new

		supplier (electrical power supplying company) shall either test the installation himself or accept the test results submitted by the consumer when same has been duly signed by the licensed electrical contractor for upto voltage of 650V, and above 650V the same shall be tested & signed by the Government authorized or NABL Accredited Electrical Testing Laboratory.		addition requires modification in order to avoid conflict.
	33(v)	(v) on application of 5 kV or 10 kV DC between pin and cap of clean and dry insulator for a period of one minute, the insulation resistance of installation shall be at least 2000 MEGA OHM or as specified in the relevant Indian Standard.	The addition requires modification	The voltage of the insulator is not mentioned in the addition.
	35(2) (ii)(iii)	(ii) a linked switch with fuse or a circuit breaker by a consumer of voltage exceeding 650V but not exceeding 33 kV having aggregate installed transformer or apparatus capacity up to 1000 KVA 500 kVA to be supplied at voltage upto 11 kV and 2500 KVA 1250 kVA at higher	Requires modification	The proposed modification is contradicting 35(3) (i) (b). Hence to be reconsidered.

		<p>voltages (above 11 kV and not exceeding 33 kV);</p> <p>(iii)a circuit breaker by consumers at voltage exceeding 650 V but not exceeding 33 kV having an aggregate installed transformer and or apparatus capacity above 1000-KVA 500 kVA to be supplied at voltage upto 11 kV and 2500-KVA 1250 kVA at higher voltages (above 11 kV and not exceeding 33 kV);</p>		
	41 Explanation	<p><i>Explanation:-</i> The expression “Class-II apparatus and appliance” shall have the same meaning as is assigned to it in the relevant Indian Standards IS: 302 (Part-1).</p>	IS 9409-1980	IS number may be added.
	42	<p>Earth leakage protective device. - The supply of electricity to every electrical installation other than voltage not exceeding 250 V, below 2-kW 1 kW and those installations of voltage not exceeding 250V, which do not attract provisions of section 54 of the Act, shall be controlled by an earth leakage protective device whose maximum earth leakage</p>	<p>After the term 1kW the following may be added In TN system and by all consumers supplied in TT system</p>	This is to ensure safety of all consumers supplied at TT system.

		<p>threshold for tripping should not exceed 30 milliamps for domestic connections and 100 milliamps for all other installations, so as to disconnect the supply instantly on the occurrence of earth fault or leakage of current:</p> <p>Provided that such earth leakage protective device shall not be required for overhead supply lines having protective devices which are effectively bonded to the neutral of supply transformers and conforming to regulation 73.</p>		
	46(2)	<p>(2) No new apparatus, cable or supply line of voltage exceeding 650 Volts shall be commissioned unless such apparatus, cable or supply line are subjected to site tests as per relevant code of practice of the Bureau of Indian Standards or International Standards.</p>	International standard if the apparatus confirms to International Standard	The International standard may be permitted only if required by the apparatus.
	46(3)	<p>(3) No apparatus, cable or supply line of voltage exceeding 650 V which has been kept</p>	-do-	-do-

		<p>disconnected, for a period of six months or more, from the system for alterations or repair, shall be connected to the system until such apparatus, cable or supply line are subjected to the relevant tests as per code of practice of Bureau of Indian Standards to site tests as per relevant Indian Standards or International Standards.</p>		
	62	<p>Conductors at different voltages on same supports.- Where conductors forming parts of systems at different voltages are erected on the same supports, the owner shall make adequate provision to guard against danger to linemen and others, from the lower voltage system being charged above its normal working voltage, by leakage from or contact with the higher voltage system and the methods of construction and the applicable minimum clearances between the conductors of the two systems shall be as specified in regulation 69 for lines crossing each other.</p>	<p>The clearance between two conductors of the two systems shall be as per the relevant Indian Standard IS5613.</p> <p>The last sentence may be modified as above.</p>	<p>The normal HT/LT posts of voltage 11kV and 415V cannot be accommodated on 9 or 11m poles which will create difficulties to suppliers in sub urban areas if clearances as per Reg69 is insisted. So in a practical approach the clearance as per IS can be permitted.</p>

<p>Mr. Shanta Rao, Vishakapatnam</p>	<p>Reg .5.</p>	<p>(2) The Electrical Safety officer shall be an Electrical Engineering degree holder with at least five years of experience in operation and maintenance of electrical installations or an Electrical Engineering diploma holder with at least 10 years of experience in operation and maintenance of electrical installations.</p>	<p>(2) The Electrical Safety officer shall be an Electrical Engineering degree holder with at least five years of experience in Design Construction operation and maintenance of electrical installations or an Electrical Engineering diploma holder with at least 10 years of experience in Design ,Construction , operation and maintenance of electrical installations.</p> <p>So as to further complications such as Contesting Court of Judicature by Design and Projects or Construction Engineers.etc...</p>	
<p>PRIME MEIDEN</p>	<p>44.2.ix</p>	<p>he shall ensure that the transformers of 10 MVA and above rating are provided with Automatic High Velocity Water Spray System designed and installed as per IS 15325 or with Nitrogen Injection Fire Protection system</p>	<p>he shall ensure that the transformers of 10 MVA and above rating it rated voltage of 66V and above are provided with Automatic High Velocity Water Spray System designed and installed as per IS 15325 or with Nitrogen Injection Fire Protection system.</p>	
<p>Mr.Ramakrishna Maheta Indian Citizen</p>		<p>with respect to above subject, I on behalf of citizen of India request you for enforcement of same notified voltage in draft of CEA (measures relating to safety and electric supply) Regulations, 2010 for electrical inspection of installations of all the States in India as well as installations of Central Government because number of companies of same owner located in different States in India found too much difficulties on each stage as well as in getting charging</p>		

		<p>g permission and Electrical Contractors - Consultants also found too much difficulties in dealing with different Electrical Inspectorates. You are requested please to enforce same notified voltage in draft of CEA (measures relating to safety and electric supply) Regulations, 2010 for all.</p>		
<p>Mr. Sunil Borse Reliance</p>	Reg - 13 (4)	<p>The Consumer shall also ensure that the installation under his control is maintained in a safe condition.</p>	<p>Remark - This is removed from the draft copy. It has to be their so that the responsibility of consumer will also remain to ensure the safe condition of installation.</p>	
	Reg 31	<p>Testing of consumer's installation.- (1) Upon receipt of an application for a new or additional supply of electricity and before connecting the supply or reconnecting the same after commencement of supply or recommencement of supply after the supply has been disconnected for a period of six months, the supplier (electrical power supplying company) shall either test the installation himself or accept the test results submitted by the consumer when same has been duly signed by the licensed electrical contractor for upto voltage of 650V, and above 650V the same shall be tested & signed by the Government authorized or NABL</p>	<p>Remark - The last line in bold font needs more clarification.</p>	

		Accredited Electrical Testing Laboratory.		
Simarte ch Projects		Please check page number 19 of draft uploaded in site, the regulation number 31 and 32 amendment shown should be in green colour, it is written in red it means it is going to be deleted / amended as per your covering letter.		
Sterelite Power	Chapter I,(zzl)	“Covered conductors” means a conductor surrounded by a covering made of insulating material as protection against accidental contacts with other covered conductors and with grounded parts such as tree branches, etc.In comparison with insulated conductors, this covering has reduced properties, but is sufficient to withstand the phase-to-earth voltage temporarily.	Covered Conductors are still not proven in the Country	
	Chapter I,(zzn)	“Areal Bunched Conductor (ABC)” are	Nothing defined.May be deleted	
	Chapter II,4(2)	If on inspection, the Electrical Inspector finds that the designated person does not comply with sub-regulation (3) of regulation 3, he shall recommend the removal of the name of such persons from the register.	Following may be included (2) If on inspection, the Electrical Inspector finds that the designated person does not comply with sub-regulation (3) of regulation 3, he shall recommend the removal of the name of such persons from the register or designation	
	Chapter II,11(3)	Every plan and section so made or corrected, or a copy thereof, marked with the date when it was	Following may be modified from 3 years to 6 months	

		made or corrected, shall be kept by the licensee at his principal office or place of business within the area of supply, and shall at all reasonable times be open to the inspection of all applicants, and copies thereof shall be supplied. Provided that existing and old plans and sections and underground distribution network shall be converted to electronic form within three years from the date of commencement of these regulations.	Provided that existing and old plans and sections and underground distribution network shall be converted to electronic form within six months from the date of commencement of these regulations.	
	Chapter III, 21	(1) Flexible cables shall not be used for portable or transportable motors, generators, transformers, rectifiers, electric drills, electric sprayers, welding sets or any other portable or transportable apparatus unless they are heavily insulated and adequately protected from mechanical injury	(1) Flexible cables shall not be used for portable or transportable motors, generators, transformers, rectifiers, electric drills, electric sprayers, welding sets or any other portable or transportable apparatus unless they are heavily insulated for required voltage as per IS and adequately protected from mechanical injury	
		(2) Where the protection is by means of metallic covering, the covering shall be in metallic connection with the frame of any such apparatus and earthed	(2) Where the protection is by means of metallic covering, the covering shall be in metallic connection with the frame inner coated with insulation of any such apparatus and earthed	
	Chapter III, 23, 3.i	to ensure that any gas which may by accident have obtained access	Following may be added to the clause	

		to the box shall escape before a person is allowed to enter; and	to ensure that any gas which may by accident have obtained access to the box shall escape before a person is allowed to enter and box should have sufficient holes for cross ventilation	
	Chapter III, 27, 2	The fire extinguishers shall be inspected, tested and maintained for satisfactory operation as per IS 2190 and record of such tests shall be maintained.	Following may be added to the clause The fire extinguishers shall be inspected, tested and maintained for satisfactory operation as per IS 2190 and record of such tests shall be maintained. Each fire extinguisher shall be noted for date of fillings and expiry date	
	Chapter III, 27, 4	Two or more gas masks shall be provided conspicuously and installed and maintained at accessible places in every generating station with capacity of 5 MW and above and enclosed sub-station with transformation capacity of 5 MVA and above for use in the event of fire or smoke: Provided that where more than one generator with capacity of 5 MW and above is installed in a power station, each generator shall be provided with at least two separate gas masks in an	This clause may be modified as following Two or more gas masks shall be provided conspicuously and installed and maintained at accessible places in every generating station with capacity of 1 MW and above and enclosed sub-station with transformation capacity of 1 MVA and above for use in the event of fire or smoke: Provided that where more than one generator with capacity of 1 MW and above is installed in a power	

		accessible and conspicuous place.	station, each generator shall be provided with at least two separate gas masks in an accessible and conspicuous place.	
	Chapter III, 27, 5	In every manned generating station, sub-station or switching station of voltage exceeding 650 V, an artificial respirator shall be provided and kept in good working condition	In every manned generating station, sub-station or switching station of voltage exceeding 250 V, an artificial respirator shall be provided and kept in good working condition	
	Chapter II, 28, 2	The owner of every generating station, enclosed sub-station, enclosed switching station and every factory or other premises to which these regulations apply, shall ensure that all designated persons employed by him are acquainted with and are competent to apply the instructions referred to in sub-regulation (1).	Following may be added to the clause The owner of every generating station, enclosed sub-station, enclosed switching station and every factory or other premises to which these regulations apply, shall ensure that all designated persons employed by him are acquainted with and are competent to apply the instructions referred to in sub-regulation (1) and refreshed for training from time to time	
	Chapter III, 30, 2	The periodical inspection and testing of installation of voltage equal to or below the notified voltage belonging to the owner or supplier or consumer, as the case may be, shall be carried out by the owner or supplier or consumer and shall be self-	The periodical inspection and testing of installation of voltage equal to or below the notified voltage belonging to the owner or supplier or consumer, as the case may be, shall be carried out by the owner or supplier or consumer and shall be self-certified for ensuring	

		certified for ensuring observance of safety measures specified under these regulations and the owner or supplier or consumer, as the case may be, shall submit the report of self-certification in the Form-I or Form-II or Form-III, as the case may be, of Schedule-IV to the Electrical Inspector.	observance of safety measures specified under these regulations and the owner or supplier or consumer, as the case may be, shall submit the report of self-certification in the Form-I or Form-II or Form-III or soft copy, as the case may be, of Schedule-IV to the Electrical Inspector.	
	Chapter III, 30, 2b	The Electrical Inspector in case of variations, which require rectification, direct the owner or supplier or consumer to rectify the same within a period of 30 days.	Following may be added to the clause The Electrical Inspector in case of variations, which require rectification, direct the owner or supplier or consumer to rectify the same within a period of 30 days and shall sent a report of compliance.	
	Chapter IV, 33,iv	on application of 5 kV or 10 kV DC between each conductor to be charged and earth for a period of one minute, the insulation resistance of installation and apparatus of voltage exceeding 33 kV shall be at least 500 MEGA OHM or as specified in the relevant Indian Standard.	This clause may be modified as following on application of 5 kV between each conductor to be charged and earth for a period of one minute, the insulation resistance of installation and apparatus of voltage exceeding 33 kV shall be in range of 500 MEGA OHM or as specified in the relevant Indian Standard.	
	Chapter IV, 33,v	on application of 5 kV or 10 kV DC between pin and cap of clean	This clause may be modified as following	

		and dry insulator for a period of one minute, the insulation resistance of installation shall be at least 2000 MEGA OHM or as specified in the relevant Indian Standard	on application of 5 kV or 10 kV DC between pin and cap of clean and dry insulator for a period of one minute, the insulation resistance of installation shall be at least 500 MEGA OHM or as specified in the relevant Indian Standard	
	Chapter IV, 35,3.i	Provided that the linked switch with fuse or circuit breaker on the primary side of the transformer may be of such capacity as to carry the full load current and to break only the magnetising current of the transformer:	This clause may be modified as following Provided that the linked switch with fuse or circuit breaker on the primary side of the transformer may be of such capacity as to carry the full load current.	
	Chapter IV, 35,6	All insulating materials shall be chosen with special regard to the circumstances of their proposed use and their mechanical strength shall be sufficient for their purpose and so far as is practicable of such a character or so protected as to maintain adequately their insulating property under all working conditions in respect of temperature and moisture	This clause may be modified as following All insulating materials shall be chosen with special regard to the circumstances of their proposed use and their mechanical strength shall be sufficient for their purpose and so far as is practicable of such a character or so protected as to maintain adequately their insulating property under all working conditions in respect of temperature, moisture and dust	

	Chapter IV, 37	Conditions applicable to installations of voltage exceeding 250 Volts.- The following conditions shall be complied with where electricity of voltage above 250 V is supplied, converted, transformed or used;	Conditions applicable to installations of voltage exceeding 220 Volts .- The following conditions shall be complied with where electricity of voltage above 220 V is supplied, converted, transformed or used;	
	Chapter IV, 37,vi	Where a supplier proposes to supply or use electricity at or to recommence supply of voltage exceeding 250 V but not exceeding 650 V after it has been discontinued for a period of six months, he shall, before connecting or reconnecting the supply, give notice in writing of such intention to the Electrical Inspector.	Where a supplier proposes to supply or use electricity at or to recommence supply of voltage in range of 220 V but not exceeding 650 V after it has been discontinued for a period of six months, he shall, before connecting or reconnecting the supply, give notice in writing of such intention to the Electrical Inspector.	
	Chapter IV, 37,vii	If at any time after connecting the supply, the supplier is satisfied that any provision of these regulations are not being observed he shall give notice of the same in writing to the consumer and the Electrical Inspector, specifying how the provisions have not been observed and to rectify such defects in a reasonable time and if the consumer fails to rectify such defects pointed out, he may discontinue the supply after giving the consumer a reasonable opportunity of being heard and recording reasons in writing and	If at any time after connecting the supply, the supplier is not satisfied that any provision of these regulations are not being observed he shall give notice of the same in writing to the consumer and the Electrical Inspector, specifying how the provisions have not been observed and to rectify such defects in a reasonable time and if the consumer fails to rectify such defects pointed out, he may discontinue the supply after giving the consumer a reasonable opportunity of being heard and recording reasons in writing and the supply shall be discontinued only on written orders of an officer duly notified by the supplier in	

		<p>the supply shall be discontinued only on written orders of an officer duly notified by the supplier in this behalf and shall be restored with all possible speed after such defects are rectified by the consumer to the satisfaction of the supplier</p>	<p>this behalf and shall be restored with all possible speed after such defects are rectified by the consumer to the satisfaction of the supplier/Electrical Inspector</p>	
	<p>Chapter 39,(4) IV,</p>	<p>For the purpose of testing or for any other purpose connected with the efficient working of the supplier's installations, the supply of electricity may be discontinued by the supplier for such period as may be necessary, subject to not less than twenty four hours notice being given by the supplier to all consumers likely to be affected by such discontinuance: Provided that no such notice shall be given in cases of emergency</p>	<p>Notice may be given through media, newspaper, announcement etc</p>	

Chapter 41,(vi)	V,	in a direct current three wire system, the middle conductor shall be earthed at the generating station only, and the current from the middle conductor to earth shall be continuously recorded by means of a recording ammeter, and if at any time the current exceeds one-thousandth part of the maximum supply current, immediate steps shall be taken to improve the insulation of the system.	in an alternating current three wire system, the common point shall be earthed at the generating station only, and the current from the common point to earth shall be continuously recorded by means of a recording ammeter, and if at any time the current exceeds one-thousandth part of the maximum supply current, immediate steps shall be taken to improve the system.	
Chapter 43,(5)	VI,	Before making an application to the Electrical Inspector for permission to commence or recommence supply in installations above the notified voltage after an installation has been disconnected for six months, the supplier shall ensure that electric supply lines or apparatus of more than notified voltage belonging to him are placed in position, properly joined	Before making an application to the Electrical Inspector for permission to commence or recommence supply in installations above the notified voltage after an installation has been disconnected for six months, the supplier shall ensure that electric supply lines or apparatus of more than notified voltage belonging to him are placed in position, properly jointed with compressed machines or crimping tools	

	Chapter VI, 44,(2.vi and vii)	a sub-station or a switching station with apparatus having more than 2000 litres of oil shall not be located in the basement where proper oil draining arrangement cannot be provided; where a sub-station or a switching station with apparatus having more than 2000 litres of oil is installed, whether indoor or outdoors, he shall take the following measures	a sub-station or a switching station with apparatus having more than 2000 litres of transformer oil shall not be located in the basement where proper oil draining arrangement cannot be provided; where a sub-station or a switching station with apparatus having more than 2000 litres of transformer oil is installed, whether indoor or outdoors, he shall take the following measures	
	Chapter VI, 44,(2. vii.b)	provisions as per regulation 43(2)(a)(iii) of CEA (Technical Standards for Construction of Electric Plants and Electric Lines) Regulations shall be made for suitable oil soakpit and where use of more than 9000 litres of oil in any one oil tank, receptacle or chamber is involved, provision shall be made for the draining away or removal of any oil which may leak or escape from the tank, receptacle or chamber containing the same,	provisions as per regulation 43(2)(a)(iii) of CEA (Technical Standards for Construction of Electric Plants and Electric Lines) Regulations shall be made for suitable oil soakpit and where use of more than 2000 litres of oil in any one oil tank, receptacle or chamber is involved, provision shall be made for the draining away or removal of any oil which may leak or escape from the tank, receptacle or chamber containing the same,	

	Chapter VI, 44,(2. xiii)		Following may be added to the clause Shall ensure proper forced ventilation at all times for cooling and disposing of inert gases evolved from transformer	
	Chapter VI, 44,(6)	There shall not be tapping of another transmission line from the main line for 66 kV and above class of lines.	There shall not be tapping of another transmission line from the main line for 33 kV and above class of lines.	
	Chapter VI, 45,(viii)	every generating station and sub-station connected to the grid at 66 kV and upto 400 kV shall be provided with disturbance recording and event logging facilities as inbuilt feature of numerical relays.	every generating station and sub-station connected to the grid from 132 kV and upto 400 kV shall be provided with disturbance recording and event logging facilities as inbuilt feature of numerical relays.	
	Chapter VI, 47,(ii)	the resistance of the earth connection with metallic sheath shall be kept low enough to permit the controlling circuit breaker or cut-out to operate in the event of any failure of insulation between the metallic sheath and the conductor	the resistance of the earth connection with metallic sheath shall be kept low less than 5 ohm enough to permit the controlling circuit breaker or cut-out to operate in the event of any failure of insulation between the metallic sheath and the conductor	
	Chapter VI, 48,(4)	Single phase systems of voltage exceeding 650 V shall be effectively earthed	Three phase systems of voltage exceeding 650 V shall be effectively earthed	

	Chapter VI, 50	Provided that in the case of pole type sub-station on wooden supports and wooden platform the metal hand-rail shall not be connected with earth.	However as far as possible wooden platform should be avoided	
	Chapter VII, 55(2)	There shall not be any joint in conductor or earthwire of an overhead line over railway, river, road and power line crossings.	There shall not be any joint in conductor or earthwire of an overhead line over railway and power line crossings.	
	Chapter VII, 57(2)	Maximum stresses and factors of safety: Overhead lines not covered in sub-regulation (1) shall have the following minimum factors of safety, namely:-(v) for Steel mono pole, self supporting - ???	Yet to be given	
	Chapter VII, 58	No conductor of an overhead line, including service lines, erected across a street shall at any part thereof be at a height of less than-	No conductor of an overhead line, including service lines, erected across a street shall at any part thereof be at a height of less than following at 32 degree temperature	
	Chapter VII, 61(6)	width of Bare Conductor	To be mentioned and this should be less than Forest corridor by use of new technology innovations	
	Chapter VII, 61(6)	Right of Way (ROW):Covered conductor is included in the table	Covered Conductors are still not proven in the Country	

	Chapter VII, 61(8)	In case of transmission lines of 33 kV and below passing through National Parks, Wildlife Sanctuaries and Wildlife Corridors, insulated (covered) conductors or underground cables shall only be used.	in case of transmission lines of 33 kV and below passing through National Parks, Wildlife Sanctuaries and Wildlife Corridors, insulated conductors or underground cables shall only be used.	
	Chapter VII, 61(9)	In case of transmission lines of 66 kV and below passing through habitated urban or rural areas insulated (covered) conductors or underground cables shall only be used.	In case of transmission lines of 66 kV and below passing through habitated urban or rural areas insulated conductors or underground cables shall only be used.	
	Chapter VII, 61(10)	Phase to earth electrical clearance (mm):Covered conductor is included in the table	Covered Conductors are still not proven in the Country	
	Chapter VII, 65(3)	No cutting of soil within ten meters from the tower structure of 132 kV and above voltage level shall be permitted without the written permission of the owner of tower structure.	No cutting of soil within ten meters from the tower structure of 132 kV and above voltage level shall be permitted	
	Chapter XII, (3)	GIS installation of 400 kV and above voltage shall be provided with partial discharge monitoring system.	GIS installation of 220 kV and above voltage shall be provided with partial discharge monitoring system.	

	Chapter XII, (4)		<p>Following may be included</p> <ul style="list-style-type: none"> a. GIS installation halls shall be provided with gas leakage directions b. GIS equipment chambers shall be provided with excess pressure devices 	
	Schedule III,10		<p>Following may be included</p> <p>All working personal shall ensure use personal safety gadgets as specified such as safety helmets,safety belts, handgloves, safety shoes and hotline shoes as required</p>	
	Schedule- X-D	Recommended width of Right of Way (ROW): Covered Conductor Included	Covered Conductors are still not proven in the Country	

<p>Tata Power</p>	<p>5.3</p>	<p>(3) The Electrical Safety Officer designated under sub-regulation (1), shall carryout periodic tests as per the relevant standards and inspection of such installations for ensuring observance of safety measures specified under these regulations at intervals not exceeding one year, and keep a record thereof in Form I or Form II or Form III, as the case may be, of Schedule IV and test reports, and also keep a register of recommended safety requirements duly acknowledged by the owner with date and compliances thereafter; and such records shall be made available to the Electrical Inspector, as and when required.</p>	<p>The Electrical Safety Officer designated under sub-regulation (1), shall carryout periodic tests as per the relevant standards and inspection of such installations for ensuring observance of safety measures specified under these regulations at intervals not exceeding one two years in case of installations upto 11 KV and once in a year in case installations above 11 KV at least once in a year, and keep a record thereof in Form I or Form II or Form III, as the case may be, of Schedule IV and test reports, and also keep a register of recommended safety requirements duly acknowledged by the owner with date and compliances thereafter; and such records shall be made available to the Electrical Inspector, as and when required.</p>	<p>One year is considered to be a short period wrt the number of equipment's to be tested, so we recommend TWO years up to 11KV level equipment's and once in a year for equipment's over 11KV level.</p>
	<p>6.2</p>	<p>(2) The technicians to assist engineers or supervisors shall possess a certificate in appropriate trade, preferably with a two years course from an Industrial Training Institute recognized by the Central Government or the State Government.</p>	<p>The technicians to assist engineers or supervisors shall possess a certificate in appropriate electrical trade, preferably with a two years course from an Industrial Training Institute recognized by the Central Government or the State Government.</p>	<p>Electrical trade is most suitable for electrical works.</p>

	19.2	<p>(2) Every person who is working on an electric supply line or apparatus or both shall be provided with personal protective equipments (PPE), tools and devices such as rubber gloves (IS 4770) and rubber safety shoes (IS 15298) suitable for working voltage, safety belts for working at height (IS 3521), nonconductive ladder, earthing devices of appropriate class, helmet (IS 2925), line tester, hand lines lamp, voltage detector and the like for protecting him from mechanical and electrical injury and such PPE, tools and devices shall conform to Indian Standards or International Standards and shall always be maintained in sound and efficient working condition.</p>	<p>Every person who is working on an electric supply line or apparatus or both shall be provided with personal protective equipment (PPE), tools and devices such as rubber gloves (IS 4770) and rubber safety shoes (IS 15298) suitable for working voltage, safety belts for working at height (IS 3521), nonconductive ladder, earthing devices of appropriate class, helmet (IS 2925), line tester, hand lines lamp, voltage detector and the like for protecting him from mechanical and electrical injury and such PPE, tools and devices shall conform to Indian Standards or International Standards and shall always be maintained in sound and efficient working condition. The electrical measuring & protection instruments shall be calibrated through a NABL accredited laboratory or agency at an interval not exceeding one year or specified by the original manufacturer of the instrument.</p>	<p>Periodic testing & its fitness certification ensures healthiness of the electrical measuring & protection instruments</p>
	19(2)	<p>Handling of electrical supply lines and apparatus.</p>	<p>LOTO locks should be provided wherever feasible.</p>	<p>For the safety of the working personnel.</p>

	25	<p>Distinction of the installations having more than one feed.- The owner of every installation including sub-station, double pole structure, four pole structure or any other structure having more than one feed, shall ensure by means of indication of a permanent nature, that the installation is readily distinguishable from other installations</p>	<p>Distinction of the installations having more than one feed.- The owner of every installation including sub-station, double pole structure, four pole structure or any other structure having more than one feed, shall ensure by means of marking of voltage level and feed details of indication of permanent nature, that the installation is readily distinguishable from other installations</p>	<p>To avoid confusion and also to make clear demarcation of different power feeds.</p>
	31	<p>Testing of consumer's installation.- (1) Upon receipt of an application for a new or additional supply of electricity and before connecting the supply or reconnecting the same after commencement of supply or recommencement of supply after the supply has been disconnected for a period of six months, the supplier (electrical power supplying company) shall either test the installation himself or accept the test results submitted by the consumer when same has been duly signed by the licensed electrical contractor for upto voltage of 650V, and above 650V the same shall be tested & signed by the Government</p>	<p>Both above and below 650 V should be certified by LEC and not by any Lab</p>	<p>This needs to be in line with the periodic testing in Clause 30.2</p>

		authorized or NABL Accredited Electrical Testing Laboratory.		
	36 (6)	<p>Provided that where height of the building is 30 Mtr or more ,distribution of electricity to the floors shall be done using rising mains or busbar trunking system.</p>	<p>Provided that where height of the building is 30 Mtr or more, distribution of electricity to the floors shall be done using rising mains or busbar trunking system.</p> <p>1) For High-rise buildings with Floor wise metering ,the point of revenue meter is to be delinked from the point of commencement of supply (normally the point of revenue metering is treated as point of commencement of supply).</p> <p>2) the starting point of bus risers shall be equipped with a Breaker of suitable rating and same shall be treated as point of commencement of supply.</p> <p>3) The installation and maintenance of such BUS risers beyond the redefined point of supply shall be in the scope of consumer.</p> <p>4)The licensee shall be provided with meter room on individual floors or designated floors ,however the arrangement for connecting the metering room to LV Bus risers shall be in the</p>	<p>Conventionally meter room is to be located on ground level, in high-rise buildings requirement of multilevel metering points is on the specific request of consumer and shifting the point of supply from the ground level to multilevel is not justified. Therefore provision of busriser and its maintenance is to be the responsibility</p>

			<p>consumers scope.</p> <p>5)The energy meters installed by the licensee inside the meter room shall be treated as point of revenue metering of the consumer. The outgoing wiring from each such meter after the cut-out shall be in the consumers scope.</p>	
	41	No provision-	<p>1) Use of building foundation piles or concrete encased rebar for earthing electrode for providing earthing for high-rise buildings .</p> <p>2) In concrete encased rebar system the entire grounding system becomes a part of the building civil works installed by the consumer .</p>	The existing regulations do not address grounding arrangement for multirise buildings
	44.2.ix	he shall ensure that the transformers of 10MVA and above rating shall be provided with Automatic High Velocity Water Spray system designed and installed as per IS 15325 or with Nitrogen Injection Fire Protection system	<p>a) he shall ensure that the transformers of 20MVA and above rating shall be provided with Automatic High Velocity Water Spray system designed and installed as per IS 15325 or with Nitrogen Injection Fire Protection system</p> <p>b) for transformers with K Class Filled Fluids ,fire safety requirements as mentioned in the International standards may be adopted. Reference Standard :IEC 61936 clause 8.7.2.</p>	With the use of K Class Fluids the Fire Safety of the installation improves manifold and the benefits of the same have to be included.

	44.2.vii.f	No provision	<p>1)Electric substation at higher level may be permitted if it is technically not feasible to locate and cater to the entire distribution of high rise building from Ground floor based substation. 2)As the grounding pits as applicable for conventional ground based substation will not be available the use of building foundation piles or concrete encased rebar for earthing electrode shall be utilised. 3)Independent tap point from the grounding bus available on the individual floor shall be deployed for MV and LV system. 4)Provision of independent shaft for equipment movement to the substation is essential and the consumer shall interact with the licensee at the design stage to ensure that adequate capacity of the same is provided .</p>	Requirement of Electric substations at higher levels is on the rise in Metros like Mumbai.
	45	<p>Inter-locks and protection for use of electricity at voltage exceeding 650 Volts.- (1) The owner shall ensure the following, namely:- (i) isolators and the controlling circuit breakers shall be inter-locked so that the isolators cannot be operated unless the corresponding breaker is in open position;</p>	<p>Inter-locks and protection for use of electricity at voltage exceeding 650 Volts.- (1) The owner shall ensure the following, namely:- 1) isolators and the controlling circuit breakers shall be mechanically inter-locked so that the isolators cannot be operated</p>	Mechanical interlock acts as a Mistake Proofing (POKAYOKA) and enhances the safety level of the power system.

		<p>(ii) isolators and the corresponding earthing switches shall be inter-locked so that no earthing switch can be closed unless and until the corresponding isolator is in open position;</p> <p>(iii) where two or more supplies are not intended to be operated in parallel, the respective circuit breakers or linked switches controlling the supplies shall be inter-locked to prevent possibility of any inadvertent paralleling or feedback;</p> <p>(iv) when two or more transformers are operated in parallel, the system shall be so arranged as to trip the secondary breaker of a transformer in case the primary breaker of that transformer trips;</p> <p>(v) all gates or doors which give access to live parts of an installation shall be inter-locked in such a way that these cannot be opened unless the live parts are made dead and proper discharging and earthing of these parts should be</p>	<p>unless the corresponding breaker is in open position;</p> <p>2) isolators and the corresponding earthing switches shall be mechanically inter-locked so that no earthing switch can be closed unless and until the corresponding isolator is in open position;</p> <p>3) where two or more supplies are not intended to be operated in parallel, the respective circuit breakers or linked switches controlling the supplies shall be mechanically inter-locked to prevent possibility of any inadvertent paralleling or feedback;</p> <p>4) when two or more transformers are operated in parallel, the system shall be so arranged as to trip the secondary breaker of a transformer in case the primary breaker of that transformer trips;</p> <p>5) all gates or doors which give access to live parts of an installation shall be mechanically inter-locked in such a way that these cannot be opened unless the live parts are made dead and proper discharging and earthing of these parts should be ensured</p>	
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		ensured before any person comes in close proximity of such parts;	before any person comes in close proximity of such parts;	
	56(2)	No joint permitted in crossing span of railway, river, road & power line	Time frame to be provided for removing existing joint. Also compression of joint to be permitted as temporary measure (time bound) for restoration & safe guarding in case of failure.	Replacement of one span of conductor in case of any damage will be a time consuming and impractical (due to sudden requirement) work.
	108	<p>Portable and transportable machines.- The person designated to operate an electrically driven coal-cutter, or other portable or transportable machine, shall not leave the machine while it is in operation and shall, before leaving the area in which such machine is operating, ensure that the supply is disconnected from the flexible cable which supplies electricity to the machine and when any such machine is in operation, steps shall be taken to ensure that the flexible cable is not dragged along by the machine: Provided that all portable and transportable machines used in underground mines shall operate on remote control from the concerned switchgear with pilot core protection.</p>	<p>Portable and transportable machines.- The person designated to operate an electrically driven coal-cutter, or other portable or transportable machine, shall not leave the machine while it is in operation and shall, before leaving the area in which such machine is operating, ensure that the supply is disconnected from the flexible cable which supplies electricity to the machine and when any such machine is in operation, steps shall be taken to ensure that the flexible cable is not dragged along by the machine: 1) Provided that all portable and transportable machines used in underground mines shall operate on remote control from the concerned switchgear with pilot core protection.</p>	<p>Portable & transportable machines are mostly tend to get mechanically damaged either the machine, the cable feeding the machines, end connectors etc. ultimately leads to the electrical shock hazards. To restrict such potential electric shock hazard, we propose installing suitably rated ELCB (Earth Leakage Circuit Breaker) with the sensitivity of 30mA leakage current.</p>

		<p>Provided further that the portable and transportable machines used in open cast mines shall have the provision such that the power supply to the machine from concerned switchgear is remotely controlled from the machine.</p>	<p>2) Provided further that the portable and transportable machines used in open cast mines shall have the provision such that the power supply to the machine from concerned switchgear is remotely controlled from the machine.</p> <p>3) Provided further that all portable and transportable machines supplied by the flexible cable shall be backup by the suitable rating ELCB with the tripping current of 30 mA .</p>	
Mr. U.L.Karna	15.	<p>Identification of earthed and earthed neutral conductors and position of switches and switchgear therein.- Where the conductors include an earthed conductor of a two-wire system or an earthed neutral conductor of a multi-wire system or a conductor which is to be connected thereto, the following conditions shall be complied with:-</p> <p>(i) an indication of a permanent nature shall be provided by the owner of the earthed or earthed neutral conductor, or the conductor which is to be connected thereto, to enable such conductor to be</p>	<p>Suggestion: Generally, Earth wire in LT line GI wire is used while for Earthed Neutral, Conductor is used so a common color of Insulator fittings (Black CI Reel) across all over India will be a common Identification.</p>	

		distinguished from any live conductor and such indication shall be provided-		
	25.	Distinction of the installations having more than one feed.- The owner of every installation including sub-station, double pole structure, four pole structure or any other structure having more than one feed, shall ensure by means of indication of a permanent nature, that the installation is readily distinguishable from other installations	Suggestions: Double insulator or any common method to be followed at this location for all over country will be beneficial.	
	37.	Conditions applicable to installations of voltage exceeding 250 Volts.- The following conditions shall be complied with where electricity of voltage above 250 V is supplied, converted, transformed or used; namely:- (i) all conductors, other than those of overhead lines, shall be completely enclosed in mechanically strong metal casing or metallic covering which is electrically and mechanically continuous and adequately protected against mechanical damage unless the said conductors are accessible only to an a designated person or are installed	Suggestion: In REAR side of a panel/switchgear ie. Behind the switchboard the minimum space more than 75 Cm but how much may be specified for 11 KV and 33 KV Switchgear.	

		<p>and protected so as to prevent danger:</p> <p>Provided that non-metallic conduits conforming to the relevant Indian Standard Specifications may be used for installations of voltage not exceeding 650 V;</p> <p>(ii) all metal works, enclosing, supporting or associated with the installation, other than that designed to serve as a conductor shall be connected with an earthing system as per standards laid down in the Indian Standards in this regard and the provisions of regulation 41.</p> <p>(iii) Every switchboard shall comply with the following,- (a) a clear space of not less than one metre in width shall be provided in front of the switchboard;</p> <p>(b) if there are any attachments or bare connections at the back of the switchboard, the space, if any, behind the switchboard shall be either less than twenty centimetres or more than seventy five centimetres in width, measured from the farthest protruding part of any attachment or conductor;</p> <p>(c) if the space behind the switchboard exceeds seventy five</p>		
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		centimetres in width, there shall be a passage way from either end of the switchboard, clear to a height of 1.8 metres. (iv) In case of installations provided in premises where inflammable mat		
	41.	Connection with earth.- The following conditions shall apply to the connection with earth of systems at voltage normally exceeding 125 V 48 V but not exceeding 650 V, namely:- (i) neutral conductor of a 3-phase, 4-wire system and the middle conductor of a 2-phase, 3-wire system shall be earthed by not less than two separate and distinct connections with a minimum of two different earth electrodes or such large number as may be necessary to bring the earth resistance to a satisfactory value as per IS: 3043 both at the generating station and at the sub-station.	Suggestion: For AC Position of neutral wire to be fixed either top for Multiple earthed neutral or at bottom for separate earth and neutral system (TN-S) for three phase or two phase .For DC the middle conductor of a 2-phase, 3-wire system may be earthed for proper identification .	
	42.	Earth leakage protective device. - The supply of electricity to every electrical installation other than voltage not exceeding 250 V, below 2 kW 1 kW and those installations of	Comments: As per this regulation, for LT line Safety device on both side of support (PCC POLE) connected to Multiple Earthed neutral of	

		<p>voltage not exceeding 250V, which do not attract provisions of section 54 of the Act, shall be controlled by an earth leakage protective device whose maximum earth leakage threshold for tripping should not exceed 30 milliamps for domestic connections and 100 milliamps for all other installations, so as to disconnect the supply instantly on the occurrence of earth fault or leakage of current:</p> <p>Provided that such earth leakage protective device shall not be required for overhead supply lines having protective devices which are effectively bonded to the neutral of supply transformers and conforming to regulation 73.</p>	<p>Transformer (shown below) is used to make the phase wire harmless if it breaks. The mechanism is it will come in contact with safety device connected to neutral of transformer and the fuse will blow out, but the fact is to maintain adequate gap between phases to avoid flashover of conductor three to four spacers are used as shown which may not actuate for all time specially when conductor snaps between the spacer.</p>	
	<p>73.</p>	<p>Safety and protective devices. - (1) Every overhead line which is not being suspended from a dead bearer wire, not being covered with insulating material and not being a trolley-wire, is erected over any part of a street or other public place or in any factory or mine or on any consumer's premises shall be protected with earth gaurding for rendering the line electrically harmless in case it breaks</p>	<p>Suggestion ;1) it is suggested that as three to four spacer are generally used to maintain the adequate gap between phases to avoid flashover the conductor at mad span so Guard wire (Cradle Guard) below the PHASE CONDUCTOR connected to neutral of transformer to entire length may be used instead of safety/Protective device which</p>	

			<p>may or may not actuate sometime . The Cradle guard for entire route length to be adopted for Entire country for better safety which is followed by CESC. Safety device as used so far to be discarded.</p> <p>2) In future For overhead LT line Conductor to be discarded and AB Cable to be encouraged which is also maintenance free and more safe.</p>	
	74.	<p>Protection against lightning. - (1) The owner of every overhead line, sub-station or generating station which is exposed to lightning shall adopt efficient means for diverting to earth any electrical surges due to lightning which may result into injuries.</p> <p>(2) The earthing lead for any lightning arrestor shall not pass through any iron or steel pipe, but shall be taken as directly as possible from the lightning arrestor without touching any metal part to a separate nearest vertical ground electrode or junction of the earth mat already provided for the sub-station of voltage exceeding 650 V subject to</p>	<p>Suggestions: Now a days very high reliability of power is required so 33 KV line using ground wire placed above the line as Shield wire may increase the reliability so Voltage class and height of pole above which ground wire is used may be specified.</p>	

		the avoidance of bends wherever practicable		
Mr. Ullas A	Chapter -1 Regulation - 2 Sub Reg- 1	<p>Definitions:</p> <p>In the CEA (MRS & ES) Amendment Regulations,2015 the following clauses are included. But in the new Draft Safety Regulations-2016 it is seen as omitted.</p> <p>Clause(fa) : Chartered Electrical Safety Engineer- altered in to “Chartered”</p> <p>Clause (sa): Electrical Inspector Of Mines</p> <p>Clause (v): Flame proof Enclosure</p> <p>Clauses (zaa): Inspecting Officer</p> <p>Clause (zc): Intrinsically Safe Circuit</p> <p>Clause (zca): Intrinsically Safe apparatus</p> <p>Clause (zka): Notified Voltage</p> <p>Clause (zwa): Self Certification</p>	<p>My Comments:</p> <ol style="list-style-type: none"> 1. “Chartered Electrical Safety Engineer”- 2. “Notified Voltage”- 3. “Self Certification”- <p>Since these three terminologies are newly introduced in the earlier amendments, these cannot be avoided in the upcoming amendments...</p> <p>Because, the Reg 30 and 43 are redefined based on these three terminologies., and a drastic change had occurred in the functioning of the State Electrical Inspectorate Departments due to these three terminologies.</p> <p>My Suggestions:</p> <ol style="list-style-type: none"> 1. In the previous amendments (13th April 2015), “Chartered Electrical Safety Engineer” is accommodated as Clause (fa). But the Clause (f): “cable”... have no connection with the new Clause (fa). <p>Hence it will be better to accommodate the “Chartered</p>	

			<p>Electrical Safety Engineer” as a new Clause, may be after Clause (zzq) as Clause (zzr).</p> <p>Example: Clause (zzr): “Chartered Electrical Safety Engineer”.....means a person authorised by the Appropriate Government as referred to in Regulation 5A</p> <p>2. In the previous amendments (13th April 2015), “Notified Voltage” is accommodated as Clause (zka). But the Clause(zk): “neutral conductor”.....have no connection with the new Clause(zka). Hence it will be better to accommodate the “Notified Voltage” as a new Clause after Clause (zzr) as Clause(zzs).</p> <p>Example: Clause(zzs): “Notified Voltage”.....means a voltage notified by the Appropriate Government for the purpose of Specifying the voltage level at which Self certification or inspection by the Electrical</p>	
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			<p>Inspector under Regulation 30 and Regulation 43.</p> <p>3. In the previous amendments (13th April 2015), “Self Certification” is accommodated as Clause(zwa). Both the Clause(zw): “street box”.....have no connection with the new Clause(zwa). Hence it will be better to accommodate the “Self Certification” as a new clause after Clause (zws) as Clause(zzt) Example: Clause(zzt): “Self Certification”.....</p> <p>4. In the previous amendments (13th April 2015), Clause (sa): Electrical Inspector Of Mines is introduced. But in the Clause(za): “inspector of mines”... is defined. So the Previous clause (sa) can be accommodated after Clause(za) , as Clause(zaa). Example: Clause(zaa): “Electrical Inspector Of Mines”.....</p> <p>5. In the previous amendments (13th April 2015), Clause(zaa): “inspecting officer” is defined..</p>	
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			<p>But in the new proposed draft, its no where mentioned. Hence it is better to define after the clause(zzt) as Clause(zzu). Example: Clause(zzu): “inspecting officer”.....means officer responsible for carrying out inspection of electrical installations under these regulations. 6. In the previous amendments (13th April 2015), Clause(zc) : “intrinsically safe circuit” is redefined and a new Clause(zca):” intrinsically safe apparatus” is introduced. But it is seen as omitted in the new Proposed draft.</p>	
	<p>Chapter- II Reg 3 – SubReg(1)</p>	<p>Proposed Draft: “ of any or all of the followings; namely:- Regulation: 19(3), 19(4), 28(2), 37(i), 39(2), 44(1)(i), 44(2)(xiii), 44(2)(xiv), 64(1), 94(2), 105(2), 105(5), 107(5), 108, 109(8).”</p>	<p>My Comments & Suggestions: Please read the regulations mentioned here, one by one... See the Reg 19(4): “(4) Every telecommunication line on supports carrying a line of voltage exceeding 650 V but not exceeding 33 kV shall, for the purpose of working thereon, be deemed to be a line of voltage exceeding 650 V.” Instead of mentioning Reg 19(4) , Reg 19 (3-i) is need to me mentioned here.</p>	

			<p>Similarly, Regulation 44(1)(i), shall be replace with Regulation 44(1)a Regulation 44(2)(xiv), is no where mentioned and may be removed. Regulation 94(2) : mentioned that it is going to be removed,</p>	
	<p>Reg 3- Sub Reg- 3</p>	<p>“ (3) No person shall be designated under sub-regulation (1) unless,- (i) he possesses a certificate of competency or electrical work permit, issued by the Appropriate Government. “</p>	<p>My Comments: Here we are saying that the designated person shall possess a certificate of competency or electrical work permit, issued by the Appropriate Government.</p> <p>The word “ certificate of competency / electrical work permit “ is not having a clear meaning,... whether the person who holds the competency certificate in MV installation can be designated in HT installation or not...?</p> <p>It again arises the question, whether the basic wireman permit holder can “ carry out duties incidental to the generation, transformation, transmission, conversion, distribution or use of electricity” in a HT/EHT installation.</p> <p>In order to avoid this, it shall be made clear that, the designated person in MV / HT / EHT</p>	

			<p>installation shall possess the required level of certificate of competency or electrical work permit.</p> <p>My Suggestion:</p> <p>“ (3) No person shall be designated under sub-regulation (1) unless,- (i) he possesses a certificate of competency or electrical work permit, issued by the Appropriate Government. “</p> <p>(ii) he possess the required level of certificate of competency or electrical work permit, in which he is designated to carry out the duties.</p>	
	Reg 4- Sub Reg-2	<p>“ (2) If on inspection, the Electrical Inspector finds that the designated person does not comply with sub-regulation (3) of regulation 3, he shall recommend the removal of the name of such persons from the register.”</p>	<p>My Comments:</p> <p>Consider the situation,</p> <p>If the Electrical inspector given order to remove the name of such persons who do not comply with sub-regulation (3) of regulation 3, and if the Consumer or manager or owner of the installation removed accordingly, then who will take care of the installation until a new person designated for that purpose.</p> <p>So, it should be done in a time bounded manner.</p> <p>The consumer or owner or manager or the person in charge of</p>	

			<p>the whole installation - shall designate a person according to the subregulation (3) of regulation 3 within 15 days from the date of removal</p> <p>My suggestions:</p> <p>4. Inspection of designated officers person(s) and other safety measures. - (1) The register maintained under sub-regulation (2) of regulation 3 shall be produced before the Electrical Inspector when required by him.</p> <p>(2) If on inspection, the Electrical Inspector finds that the designated person does not comply with sub-regulation (3) of regulation 3, he shall recommend the removal of the name of such persons from the register.</p> <p>(2)(i) if removed as per the direction under Sub regulation(2), a new person shall be re designated under sub-regulation (2) of regulation 3 and the same shall be intimated to the Electrical inspector in writing, within 15 days from the date of removal.</p>	
	Regulation 5		Sub Regulation 3 – paragraph is repeated.	
	Regulation 6 – Sub Reg 1	“ shall hold degree or diploma in	My Comments:	

		<p>Engineering from a recognized institute or university.”</p>	<p>Here it is not clearly mentioned that, what type of degree / diploma that a person can possess to get engaged as per the regulation 6. Whether he can have a degree/ diploma in “ Information Technology”?</p> <p>Whether he can have a degree/ diploma in “ Computer Science”?</p> <p>Whether he can have a degree/ diploma in – some other funny engineering subjects which do not have any connection with electrical engineering.?</p> <p>The reason behind my question is , in kerala The Major Supplier,Transmission, Distribution utility is owned by the state known by the name” Kerala State Electricity Board Ltd”. In their EHT substations and power plants the engineering graduates/diploma holders who are in charge have relevant degree/diploma in “Electronics and Communication”.</p> <p>If a person having degree/diploma in “Electronics and Communication” can be engaged under the Regulation 6., then what makes the difference with a mechanical engineer/</p>	
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			<p>instrumentation engineer/ computer science engineer/.....engineers who are ready to under go the training as mentioned under Sub regulation 3.</p> <p>Since there is no meaning in discussing about the electrical safety and standards to a person who not possess electrical engineering degree/ diploma.</p> <p>So it is very much become necessary to point out that, the relevant degree/diploma shall be in electrical engineering field.</p> <p>My suggestions: “ shall hold degree or diploma in Electrical Engineering from a recognized institute or university.”</p>	
	Reg 7- Sub Reg- 1	<p>Proposed Draft: (1) Engineers or supervisors engaged or appointed in operation and maintenance to operate or undertake maintenance of transmission and distribution systems shall hold degree or diploma in electrical, mechanical, electronics and instrumentation Engineering from a recognized institute or university.</p>	<p>My Comments: Here also the basic question, how a mechanical, electronics and instrumentation Engineering degree/diploma holder can ensure the safety measures for operation and maintenance of transmission, distribution systems.</p> <p>Since we are dealing with electrical safety and standards based on the Electricity Act-2003</p>	

			<p>& “Measures Relating to Safety and Electric Supply”, what’s the role of a mechanical, electronics and instrumentation engineering peoples in this current scenario.</p> <p>Situation in our state: Kerala:</p> <p>Here the State owned Supplier/transmission/distribution utility appointed enough electronics engineers in their entire transmission sectors. During the time of periodical inspections, the Electrical inspectorate officials often came to understand that the persons who are in charge of the station doesn’t knew the basics of power systems. Its a baseless and meaningless approach from the side of law makers, to engage those kind of peoples who do not know electrical engineering and discussing about ensuring electrical safety and standards.</p>	
	<p>Chapter III Regulation- 16 Sub Reg- 4</p>	<p>(4) “ Save as otherwise provided in these regulations, TN system of earthing as per IS 732 shall be followed by the Supplier to carry out the purpose of this regulation.”</p>	<p>My Comments: “TN system of earthing as per IS 732 shall be followed by the Supplier.....” Here IS 932 can be replace with IS 3043/1987. In IS 732/ 1989 CODE OF PRACTICE FOR ELECTRICAL</p>	

			<p>WIRING INSTALLATIONS (Third Revision): under section 10 - EARTHING ARRANGEMENT AND PROTECTIVE CONDUCTORS (see IS 3043.1987). , the IS 732/1989 itself refers to IS 3043/1987.</p> <p>My Suggestion: (4) “ Save as otherwise provided in these regulations, TN system of earthing as per IS 3043/1987 shall be followed by the Supplier to carry out the purpose of this regulation.”</p>	
	Reg 30- Sub Reg- 2b	“30 (2b) The Electrical Inspector in case of variations, which require rectification, direct the owner or supplier or consumer to rectify the same within a period of 30 days.”	<p>My Comments: Here there is no provision to ensure the defects to be rectified by the owner or supplier or consumer within 30 days. So it is to be made clear that, the owner or supplier or consumer shall intimate the Electrical Inspector in writing, that the intimated variations/defects are rectified. In the event of the failure of the owner or supplier or consumer of any installation to rectify the defects in his installation pointed out by the Electrical Inspector in his report and within the time indicated therein, such installation</p>	

			<p>shall be liable to be disconnected under the directions of the Electrical Inspector after serving the owner of such installation with a notice for a period not less than forty eight hours</p> <p>My suggestions:</p> <p>“</p> <p>30 (2c) The Electrical Inspector shall, in case of recording of variations, inspect the electrical installation within a period of one year from the date of submission of self-certification report after recording the justification for such inspection and submission of a copy of the reasons to the Appropriate Government and the owner or supplier or consumer of the installation.</p> <p>“</p> <p>The above regulation can be replaced with</p> <p>“</p> <p>30 (2c) In the event of the failure of the owner or supplier or consumer of any installation to rectify the defects in his installation pointed out by the Electrical Inspector in his report and within the time indicated therein, such installation shall be</p>	
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			<p>liable to be disconnected under the directions of the Electrical Inspector after serving the owner of such installation with a notice for a period not less than forty eight hours “ and hence the unwanted procedures of inspection and reporting it to the government after giving justification for the inspection within one year of self certificationcan be avoided.</p>	
	<p>Reg 43- Sub Reg- 4(ii)</p>	<p>(4-ii) The Electrical Inspector shall, in case of recording of variations, inspect the electrical installation within a period of one year from the date of submission of self-certification report after recording the justification for such inspection and submission of a copy of the justification to the Appropriate Government and the owner or supplier or consumer of the installation</p>	<p>My suggestions: If the consumer not rectified the defects in his system as per the direction obtained from the electrical inspector, there is no other way to take any more remedial measures. Here too, the unwanted procedures of inspection and reporting it to the government after giving justification for the inspection within one year of self certificationcan be avoided., by altering the above mentioned regulation with the below one: (4-ii): In the event of the failure of the owner or supplier or consumer of any installation to rectify the defects in his installation pointed out by the Electrical Inspector in</p>	

			his report and within the time indicated therein, such installation shall be liable to be disconnected under the directions of the Electrical Inspector after serving the owner of such installation with a notice for a period not less than forty eight hours	
	Reg 58 Sub Reg-4	(4) For lines of voltage exceeding 33 kV but not exceeding 400 kV and having the voltage other than nominal voltage, the clearance above ground shall not be less than 5.2 metres plus 0.3 metre for every 33,000 Volts 33 kV or part thereof by which the voltage of the line exceeds 33,000 Volts 33 kV; Provided that the minimum clearance along or across any street shall not be less than 6.1 metres.	The provision for lines of voltage exceeding 33 kV shall be reinstated	
	Regulation 64	Transporting and storing of material near overhead lines.- (1) No rods, pipes or similar materials shall be taken below, or in the vicinity of, any bare overhead conductors or lines if these contravene the provisions of regulations 60 and 61 unless such materials are transported under the direct supervision of a person designated under regulation 3(1) or engaged or appointed under regulation 6(1) or	designated word is repeated	

		regulation 7(1) in that behalf by the owner of such overhead conductors or lines.		
TETD, CEA	Regulation 36 (7)	(7) Lightning protection of the building shall be as per IS/IEC 62305-1/2/3/4.	Proposed to be introduced now as "Lightning protection of the building shall be as IS/IEC 62305	The lightning protection should not be in the scope of this Regulation as this Regulation is meant for Measures relating to safety and electric supply and lightning protection of the building does not relate to electric supply and should be covered under Building Code. As such the proposed clause may not be included in this Regulation
	Regulation 44(2)(ix)	(ix) he shall ensure that the transformers of 10 MVA and above rating or in case of oil filled transformers with oil capacity of more than 2000 liters are provided with fire fighting system as per IS-3034:1993 shall be provided with Automatic High Velocity Water Spray System designed and installed as per IS 15325 or with Nitrogen Injection Fire Protection system;	Please refer our letter No. CEA/TETD-EL/Mis(Tech)/2016/571 dated 20.5.16 and subsequently CEA/TETD-EL/Mis(Tech)/2016/935 dated 11.08.2016. This has reference to above letter regarding proposed amendment in the Regulation 44(2)(ix) of "CEA (Measures relating to Safety and Electric Supply) Regulations, 2010", "Transformers of 10 MVA and above rating or in case of oil	

			<p>filled transformer with oil capacity of more than 2000 liters are provided with firefighting system as per IS - 3034: 1993 or with Nitrogen Injection Fire Protection system" delinking oil capacity from the transformer rating and replacing the existing Regulation with proposed as "Transformer of 10MVA and above rating are provided with firefighting system as per IS: 3034: 1993 or with Nitrogen Injection Fire Protection System". Our observations are as given below:</p> <p>1. Existing provision of Regulation 44(2)(ix) which is as "Transformers of 10 MVA and above rating or in case of oil filled transformer with oil capacity of more than 2000 liters are provided with firefighting system as per IS - 3034: 1993 or with Nitrogen</p>	
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			<p>Injection Fire Protection system" is clearly in line with IS-3034: 1993 which also mentions the same in para 8.8.1 (copy enclosed for ready reference). In our opinion, the said Regulation consists of two different criterion of considerations, the one is about mineral oil filled transformers and the basis of consideration of providing fire protection system is the mineral oil quantity (which is 2000 Itrs. or more), as fire hazards posed need to be countered, irrespective of voltage rating and MVA capacity of transformers and the other criteria is about non mineral oil filled transformers, and the criteria is MVA capacity of transformers which is above 10MVA, wherein firefighting system has to be provided as per IS-3034: 1993 or with Nitrogen Injection Fire Protection system.</p>	
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			<p>2. Same Provision has also been incorporated in other Regulation 12(5)(f)(i)(A) of the "Central Electricity Authority (Technical Standards for construction of Electrical Plants and Electric Lines) Regulation, 2010". These Regulations were framed by constituting a Committee comprising members from NTPC and other stakeholders/consultants etc.</p>	
	<p>Regulation 45 (viii)</p>	<p>(viii) every generating station and sub-station connected to the grid at 220 kV 66 kV and above shall be provided with disturbance recording and event logging facilities either stand alone or as inbuilt feature of numerical relays and all such equipment shall be provided with time synchronization facility for global common time reference but wherever numerical relays with provision of recording fault data are</p>	<p>every generating station and sub-station connected to the grid at 220 kV 66 kV and upto 400 kV shall be provided with disturbance recording and event logging facilities <u>either standalone or</u> as in-built feature of numerical relays. The generating station and sub-station connected to the grid at 765 kV and 1150 kV shall be provided with standalone disturbance recording and event</p>	<p>Provided, there is no specific reason for keeping in-built feature of numerical relay</p>

		<p>installed, disturbance recorder and event logger may not be installed and upto 400 kV shall be provided with disturbance recording and event logging facilities as inbuilt feature of numerical relays. The generating station and sub-station connected to the grid at 765 kV and 1150 kV shall be provided with stand alone disturbance recording and event logging devices and all such equipment shall be provided with time synchronization facility for global common time reference;</p> <p>Provided that the existing 66 kV, 110 kV and 132 kV sub-stations sub-station connected to the grid at 220 kV 66 kV and above shall be provided with disturbance recording and event logging facilities either stand alone or as inbuilt feature of numerical relays with in two years from the date of coming into force of these regulations.</p>	<p>logging devices and all such equipment shall be provided with time synchronization facility for global common time reference;</p>	
JEF TECHNO SOLUTIONS	Regulation 41 (i)	Neutral conductor of a 3-phase, 4-wire system and the middle conductor of a 2-phase, 3-wire system shall be earthed by not less than two separate and distinct connections with a minimum of two different earth electrodes or such large number as may be necessary to bring the	Soil Resistivity Test is to be done before designing Earthing System for any application. Recommended Methodology – 4 Point Method as prescribed in IEEE 81 – 2012 Standard.	Justification: Soil Resistivity is one of most important parameter for designing the Earthing System for any electrical installation. Specification, Size and Quantity of Earth Electrodes

		earth resistance to a satisfactory value as per IS: 3043 both at the generating station and at the sub-station.		and Earth Conductor (Strip / Flat) to make an electrical system safe depends on Soil Resistivity apart from other factor like fault current and hence this suggestion.
	Regulation 41 (xv) (b)	limit earth resistance sufficiently low to permit adequate fault current for the operation of protective devices in time and to reduce neutral shifting;	Low Voltage (LV) Electricity users should conduct Earth Loop Impedance Test to ensure that the total impedance / resistance of their Earth Loop comprising of Phase Conductor, earth electrode and earth conductor (Strip / Flat) is within the limits prescribed by IEE 48 regulation / BS 7671 – i.e, 0.8 Ohms for TNS and 0.35 Ohms for TNCS Systems. It is recommended that this test is be done periodically on each and every LV Main Panel, Distribution and Sub Distribution Boards.	Justification: If the earth loop impedance / resistance is higher than the limits prescribed above, then adequate fault current may not flow in the electrical circuit which will result in either (a) protective device not tripping or (b) protective device will take longer time to trip. Both these situations may result in an accident.
	Regulation 41 (xv) (b)	limit earth resistance sufficiently low to permit adequate fault current for the operation of protective devices in time and to reduce neutral shifting;	Low Voltage (LV) Electricity users should conduct Prospective Fault Current Test (as per BS 7671) to ensure that adequate fault current flows in the electrical circuit so that protective devices operate within the prescribed time limit to isolate the fault. It is recommended that this test is be done periodically on each and	Justification: Prospective Fault Current measured to be compared with Time Vs Current characteristic curve of the protective device to calculate the time taken by the protective device to trip the faulty circuit. If this time exceeds the safe operating time limit of the

			every LV Main Panel, Distribution and Sub Distribution Boards.	protective device, then it may lead to an accident.
	Regulation 41 (xvi)	All earthing systems belonging to the supplier shall in addition, be tested for resistance on dry day during the dry season not less than once every two years at least once a year.	Soil Resistivity Test should also be conducted at least once year in addition to testing the earthing system. Recommended Methodology – 4 Point Method as prescribed in IEEE 81 – 2012 Standard.	Justification: Soil Characteristics may vary across seasons and change over a period of time. Soil Resistivity is one of the important parameter to determine the specifications and quantity of Earthing system and hence it is suggested to conduct Soil Resistivity Test also at least once a year along with Earthing System Test to ensure safety of the overall Earthing system.
	Regulation 42	Earth leakage protective device. - The supply of electricity to every electrical installation other than voltage not exceeding 250 V, below 2kW 1 kW and those installations of voltage not exceeding 250V, which do not attract provisions of section 54 of the Act, shall be controlled by an earth leakage protective device whose maximum earth leakage threshold for tripping should not exceed 30 milliamps for domestic connections and 100 milliamps for all other installations, so as to disconnect the supply instantly on the occurrence of earth fault or leakage of current:	Functional Test should be conducted on Earth Leakage Protective Devices periodically to ensure that they operate and disconnect the supply instantly on the occurrence of earth fault or leakage current. Prescribed Earth leakage current of 30 or 100 milliamps to be passed through the earth leakage protective device using an external test equipment and check whether the protective device trips.	Justification: Test as above is recommended to ensure physical and functional operation of an important protective device in case of a fault.

		Provided that such earth leakage protective device shall not be required for overhead supply lines having protective devices which are effectively bonded to the neutral of supply transformers and conforming to regulation 73.		
	General – Electrical Thermography Test		Thermography Test to be done on electrical equipment such as Transformers, LV switchgears, Main Panels, Distribution and Sub Distribution Panels, Motors and Cables to identify excess heat if any generated in the equipment. Data obtained from Thermography test using Thermal Imaging Principle can be analyzed and suitable remedial measures taken to prevent accidents and ensure safety to personnel and equipment. NFPA 70 B standard recommends that Thermography should be done as a part of annual preventive maintenance schedule	Justification: This is a non-destructive test which can help to identify potential risks due to excessive heat which can result into fire accidents, burns and injuries to personnel. This can happen due to loose & high resistance connections, Unbalanced and Over Loads, Component malfunction and failure, Harmonic currents, Improper Cooling, Misalignment of Equipment, Insulation Failure and Bearing - Excessive Wear and Inadequate Lubrication. Once identified user can take appropriate measures to mitigate the risk.
	General: Preventive Maintenance of Electrical Equipment		All electrical equipment such as transformers, HV, MV and LV switchgears, Main Panels, Distribution and Sub Distribution Panels, Motors, Uninterruptible Power Systems and other	Justification: Prescribed Preventive Maintenance can eliminate accidents and safety to operators and technicians.

			electrical / electronic equipment should undergo periodic Preventive Maintenance Schedule as prescribed by the respective supplier to ensure that they operate and perform safely. This can detect any potential defect in the equipment and proactively rectify the same in order to avoid any accident.	
	General: Dos and Don'ts Charts to be kept near every electrical equipment		Suppliers of all electrical equipment such as transformers, HV, MV and LV switchgears, Main Panels, Distribution and Sub Distribution Panels, Motors, Uninterruptible Power Systems and other electrical / electronic equipment should provide Dos and Don'ts Charts for their respective equipment so that the Operation & Maintenance (O&M) personnel can follow the same in order to avoid any accident. Suppliers to provide training to O&M personnel on their respective equipment.	Justification: These charts can clearly indicate to the operation & maintenance what they can do and what they should not do so that they are fully aware of the steps involved in routing operation and maintenance of electrical equipment and thus avoid any potential accident.
	General: Escalation Matrix Chart to be kept near every electrical equipment		Suppliers of all electrical equipment such as transformers, HV, MV and LV switchgears, Main Panels, Distribution and Sub Distribution Panels, Motors, Uninterruptible Power Systems	Justification: This data can help O&M personnel to contact respective equipment supplier in case of an emergency situation (especially O&M personnel working in night shifts) and seek

			and other electrical / electronic equipment should provide an Escalation Matrix Chart of their organization with key personnel name and contact mobile phone numbers so that Operation & Maintenance (O&M) personnel can contact them in case of an emergency.	guidance / support so that any potential accident can be avoided.
	General: Air and Gas Insulated HV and EHV Substation Earthing System Design		All state, central and private power utilities shall design the Earthing System for HV and EHV Substations as per Latest IEEE 80 – 2013 “Guide for Safety in AC Substation Grounding”. Soil Analysis and Modeling should be done considering Multilayer (Three layers and above) modeling. Touch & Step Potential Limits, Ground Potential Rise (GPR) Limit, Transient Analysis for Lightning and Switching Surges, Transfer Potential Analysis and Overall Ground Grid Impedance to be calculated and the design should ensure that all the above parameters are within safe limits. It is recommended that the Earthing System design and analysis is carried out using a	Justification: A careful, accurate, reliable and sound Earthing System Design can ensure safety to operating personnel and equipment in the Substation.

			reputed Computer Software Package.	
	General: Air and Gas Insulated HV and EHV Substation Earthing System Field Acceptance Test (FAT) before Commissioning of the Substation.		All state, central and private power utilities shall conduct a Field Acceptance Test (FAT) on the complete Earthing System to ensure the total integrity of the system. Safety parameters such as Touch and Step Potentials and Overall Ground Grid Impedance should be measured to ensure that they are within the design limits.	Justification: Normally FAT is done on all substation equipment such as Transformers, Circuit Breakers, Current Transformers, Potential Transformers, Lightning Arrestors and Isolators. FAT on Earthing System will bring any defect / missing integrity during the physical installation so that the same can be rectified before commissioning of the substation. Thus, safety can be ensured.
	General: Air and Gas Insulated HV and EHV Substation Periodic Health Assessment of Earthing System		All state, central and private power utilities shall conduct periodic Health Assessment on Earthing System in order to identify defective / faulty risers and missing integrity / continuity of grid conductor so that the same can be rectified for which Riser and Grid Integrity Tests to be conducted. Soil Resistivity Test, Earth Electrode Resistance Test, Effect of Corrosion on Grid Conductor and Touch & Step Potential Measurements to be conducted to identify defects and rectify the same so as to ensure	Justification: Soil Characteristics may vary across seasons and change over a period of time. Earth Electrodes and Earth Grid Conductor can corrode, System and Asset Modifications can happen at the Substation, Equipment / Bays can be added and Fault Levels can increase. All these changes and modifications can render original design of earthing system invalid and safety could be at threat. Hence periodic health assessment of Substation Earthing System is

			overall health of the Substation Earthing System. In addition, a software simulation is also recommended to cross check the design and field test parameters.	recommended to ensure safety to personnel and equipment.
	Challenges faced while designing earthing system for Gas Insulated Substations (GIS):		<ol style="list-style-type: none"> 1. The area occupied by a GIS Substation is typically only 25% of that of the equivalent air insulated installation. 2. Induced Currents developed due to circulating currents through the bus-bars. 3. Fast Transients over voltages and TGPR analysis. 4. The earthing system designed has to be analyzed for both Internal & External Faults. 5. Achieving overall grid impedance value in higher soil resistivity area (Typically <1 Ohm). 6. To obtain an accurate & optimized design within specified GIS area. 	
	Special considerations as per std. IEEE80-2013 for Gas Insulated Substations		<ol style="list-style-type: none"> 1. As per clause no 8.3 of IEEE80-2013 a GIS should be analyzed for two basic fault conditions: - <ol style="list-style-type: none"> a). An Internal Fault within the gas-insulated bus system, such as a flashover between the 	Justification: Since GIS is complex in terms of total space available, metallic enclosure and generally situated in Metros close to residential and commercial complexes careful Earthing Design using Computer aided Software and calculation /

			<p>bus conductor and the inner wall of the enclosure-Enclosure fault. (b). A Fault external to the GIS in which a fault current flows through the GIS bus and induces currents in the enclosures.</p> <p>2. As per clause 8.4 & 10.3 of IEEE80-2013 Metal to Metal Voltage & Enclosure currents to be calculated.</p> <p>3. As per clause 8.3 & 10.8 Touch Voltage & Step potentials to be calculated for Enclosure fault.</p> <p>4. Evaluation of Transient Ground Potential Rise due to VFTs –As per clause 10.1 of IEEE802013.</p> <p>5. Determination of Touch & Step Potentials in GIS Room area where there is no surface layer for both Bus fault & Enclosure fault conditions-As per clause 10.8 of IEEE80-2013.</p> <p>In view of the above challenges faced as prescribed in point 13 above, we recommend that entire GIS Design should be done through a computer aided software and all special considerations mentioned in point 14 above should be calculated,</p>	<p>analysis and evaluation of all suggested parameters can ensure safety to humans and equipment.</p>
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			analyzed and evaluated. This is prescribed by IEEE 80 – 2013 “Guide for Safety in AC Substation Grounding”.	
Nitin Fire Protection Industries Ltd.	44(2) (ix)	he shall ensure that the transformers of 10 MVA and above rating or in case of oil-filled transformers with oil capacity of more than 2000 liters are provided with fire fighting system as per IS – 3034: 1993 shall be provided with Automatic High Velocity Water Spray System designed and installed as per IS 15325 or with Nitrogen Injection Fire Protection system;	he shall ensure that the transformers of 10 MVA and above rating shall be provided with Automatic Water Mist System with a detection system comprising of a linear heat hollow detection tube without any moving parts alongwith Nitrogen Injection Fire Protection system.	Nitrogen injection fire protection system is designed to prevent fires during internal faults resulting in tank explosion and that is why a linear heat hollow detection tube shall be used alongwith it for detecting direct and indirect fire exposures, helping detect fire at early stages. For external fires in transformers and for quick extinguishments, high pressure water mist system is recommended as it is widely used across the world mainly because it consumes much less water, making it effective even in places suffering from scarcity of water. Also, OLTC fires and fire from surrounding equipments can only be extinguished externally with high pressure water mist systems.
	44(2) (xii)	(xii) he shall ensure that cable trenches inside the sub-stations and switching stations containing cables are filled with sand, pebbles or	he shall ensure that cable trenches inside the sub-stations and switching stations containing cables are filled with sand,	For detection of fire & overheating of cables in the cable trenches and cable gallery, these detectors are more

		similar non-inflammable materials or completely covered with non-inflammable slabs;	pebbles or similar noninflammable materials or completely covered with non-inflammable slabs. A fire detection system comprising of a linear heat hollow detection tube with no moving parts shall be provided. Also, the detector shall be IP67.	suitable. Linear heat hollow detection tube type detector can detect direct & indirect fire exposures and are highly accurate, rodent free and re-useable even after the fire events.
	Chapter XI - Additional safety requirements for HVDC. Pg. 73 of 109	(2) Smoke Detection system shall be provided in the valve hall to facilitate the early detection of fire in the valve hall.	(2) Detection system with combination of heat and smoke type shall be provided in the valve hall to facilitate the early detection of fire in the valve hall.	It is recommended to provide a combination of heat & smoke detectors to avoid faults in the system.
	Requirement to prevent fire for solar park. Pg. 77 of 109	(1) Fire fighting system for inverter room and control room shall be as per relevant provisions of CEA (Technical Standards for Construction of Electrical plants and Electrical Lines) Regulations.	(1) Fire fighting system for inverter room and control room shall be as per relevant provisions of CEA (Technical Standards for Construction of Electrical plants and Electrical Lines) Regulations. Automatic Inert gaseous fire suppression systems shall be provided in control rooms.	It is recommended to consider automatic Inert gaseous fire suppression system for control rooms as these are key areas for a plant but at the same time very vulnerable to be exposed to fire risks. Inert gases are widely used across the world for fire protection as they are available naturally in abundance and can be used without causing any harm to the environment. Inert gas is a clean agent gas.

<p>Mr.P.N.Gandhi, CEI Gujarat</p>	<p>Regulation 2: Sub-Regulation (1)</p>	<p>(zzl) “Covered conductors” means a conductor surrounded by a covering made of insulating material as protection against accidental contacts with other covered conductors and with grounded parts such as tree branches, etc. In comparison with insulated conductors, this covering has reduced properties, but is sufficient to withstand the phase-to-earth voltage temporarily.</p> <p>(zzn) “Areal Bunched Conductor (ABC)” are</p>	<p>(zzl):</p> <p>The new term ‘Covered Conductors’ is to be corrected as “Covered Conductor”</p> <p>Since the covering has reduced property in comparison with the insulated conductors, as defined, it needs to be more specific so as to ensure the required safety.</p> <p>(zzn):</p> <p>The term may be used as “Aerial Bunched Cable” instead of “Aerial Bunched Conductor” looking to the basic configuration of ABC and may be defined as follows.</p> <p>“Aerial Bunched Cable” means the insulated conductors (3 or 4 nos. as required) twisted around a high strength Aluminum Alloy Bearer Wire, may be bare or insulated and carries the main weight and also serves as the earth-cum-neutral wire. (Refer IS 14255:1995, reaffirmed 2005)</p>	
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	<p>Regulation 12</p> <p>Sub-Regulation (4)</p>	<p>(4) All electrical equipment shall be installed above the Mean Sea Level (MSL) as declared by local Municipal Authorities and where such equipment is to be installed in the basement, consumer shall ensure that the design of the basement should be such that there is no seepage or leakage or logging of water in the basement and shall ensure compliance of regulation 44(2)(x).</p> <p>Provided that where such MSL is not declared by the local Municipal Authority, Highest Flood Level (HFL) recorded data by the local authority shall be used for this purpose.</p>	<p>In the proviso under this sub-regulation the words “recorded data” may be substituted by the words “data recorded”.</p>	
	<p>Regulation 12</p> <p>Sub-Regulation (5)</p>	<p>(5) Owner of shall display conspicuously a Single Line Diagram of every electrical installation belonging to him.</p>	<p>The words “Owner of” in the beginning of this sub-regulation may be substituted by the word “Owner” as the word “of” is not required grammatically.</p>	
	<p>Regulation 27:</p>	<p>(3) Sufficient number of first-aid boxes or cupboards conspicuously marked and equipped with such</p>	<p>The words “at all time” may be substituted by “at all the times”.</p>	

	<p>Sub-Regulation (3)</p>	<p>contents as the State Government may specify or as per IS 13115, shall be provided and maintained at appropriate locations in every generating station, enclosed sub-station, enclosed switching station and in vehicles used for maintenance of lines so as to be readily available and accessible during all working hours at all time and all such boxes and cupboards shall, except in the case of unattended sub-stations and switching stations, be kept in charge of responsible persons who are trained in first-aid treatment and one of such persons shall be available during working hours.</p>		
	<p>Regulation 30: Sub-Regulation (3)</p>	<p>(3) The periodical inspection and testing of installations of voltage above the notified voltage belonging to the supplier or consumer shall be carried out by the Electrical Inspector.</p> <p>Provided that the supplier or owner or consumer has the option to get his installation inspected and tested by the Electrical Inspector of the Appropriate Government:</p>	<p>The words “owner or” may be inserted before the word “supplier” as specified in similar sub-regulation (2) of this regulation.</p>	

		Provided further that the every electrical installation of mines, oil fields and railways shall be periodically inspected and tested by the Electrical Inspector of the Appropriate Government.		
	Regulation 31: Sub-Regulation (1)	(1) Upon receipt of an application for a new or additional supply of electricity and before connecting the supply or reconnecting the same after commencement of supply or recommencement of supply after the supply has been disconnected for a period of six months, the supplier (electrical power supplying company) shall either test the installation himself or accept the test results submitted by the consumer when same has been duly signed by the licensed electrical contractor for upto voltage of 650V, and above 650V the same shall be tested & signed by the Government authorized or NABL Accredited Electrical Testing Laboratory.	Considering very limited availability of Government Authorized or NABL Accredited Electrical Testing Laboratory the amendment proposed may be reviewed in context with the ease of doing business	
	Regulation 43:	Every electrical installation of notified voltage and below shall be inspected, tested and shall be self-certified by the owner or supplier or consumer, as the case may be, of the installation before	The words “and shall be self-certified by the owner or supplier or consumer, as the case may be, of the installation ” in this sub-regulations may be substituted by	

	<p>Sub-Regulation (1)</p>	<p>commencement of supply or recommencement after shutdown for six months and above for ensuring observance of safety measures specified under these regulations and such owner or supplier or consumer shall submit the report of self-certification in the Form-I or Form-II or Form-III, as the case may be, of Schedule-IV to the Electrical Inspector.</p> <p>Provided that the owner or supplier or consumer has the option to get his installation inspected and tested by the Electrical Inspector of the Appropriate Government.</p> <p>Provided further that every electrical installation covered under section 54 of the Act including every electrical installations of mines, oil fields and railways shall be inspected and tested by the Electrical Inspector of the Appropriate Government as specified in sub-regulation (3).</p>	<p>the words “and shall be self-certified by the owner or supplier or consumer of the installation, as the case may be,”.</p> <p>The words “Form-I or Form-II or” and the words “as the case may be,” are proposed to be deleted. It may be necessary when the self-certification has been made in respect of the installation of the voltage below 650 V.</p>	
	<p>Regulation 43</p>	<p>(2) The voltage above which inspection and testing of electrical installations including installations of supplier or consumer shall be carried out by the</p>	<p>The words “owner or” may be inserted before the word “supplier” as specified in similar</p>	

	<p>Sub-Regulation (2)</p>	<p>Electrical Inspector shall be notified by the Appropriate Government.</p>	<p>sub-regulation (2) of this regulation.</p>	
	<p>Regulation 60 (4) and 61 (3)</p>	<p>60 (4) The horizontal clearance shall be measured when the line is at a maximum deflection from the vertical due to wind pressure.</p> <p>61 (3) The horizontal clearance between the nearest conductor and any part of such building shall, on the basis of maximum deflection due to wind pressure, be not less than-</p>	<p>For the purpose of calculation of horizontal clearance from building of lines, maximum deflection due to wind pressure is required to be considered as per these sub-regulations.</p> <p>However, it becomes difficult to calculate such deflection in absence of data of wind pressure in some instances. Therefore, it may be desirable to consider deflection of some angle, like 35 degree given in the erstwhile IE Rules, 1956, to facilitate the measurement of clearances.</p>	

		<p>(i) for lines - 1.2 metres of voltages exceeding 650 Volts upto and including 11,000 Volts 11 kV</p> <p>(ii) for lines - 2.0 metres of voltages exceeding 11,000 Volts 11 kV upto and upto and including 33,000 Volts 33 kV</p> <p>(iii) for lines - 2.0 metres of voltages plus 0.30 metre exceeding 33 kV fore for every additional</p>		
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		33 kV or part thereof.		
Cargill India Pvt. Ltd.	44.2.vii	<p>(vii) where a sub-station or a switching station with apparatus having more than 2000 litres of oil is installed, whether indoor or outdoors, he shall take the following measures, namely:-</p> <p>(a) the baffle separation wall or fire barrier walls of four hours fire rating shall be provided between the apparatus,-</p> <p>(i) where there is a single phase transformer banks in the switch-yards of generating stations and sub-stations;</p> <p>(ii) on the consumer premises;</p> <p>(iii) where adequate clearance between the units as per IS: 3034 1646 for O-class oil or as per IEC 61936-1 for K-class oil is not available.</p>	<p>Where a substation or a Switching station with the apparatus having more than 2000 liters including K Class fluid is installed whether outdoors or indoors ,he shall take the following measures -</p> <p>(a) adequate clearance between the units and buildings to be provided</p> <p>(i) as per IS: 3034 :1993 for O-class oil or as per IEC 61936-1:2010 or latest revisions for K-class oil</p> <p>(ii) the baffle separation wall or fire barrier walls of four hours fire rating shall be provided between the apparatus or building if the required clearance is not available.</p>	
	44.2.vii.b	<p>b)provisions as per regulation 43(2)(a)(iii) of CEA (Technical Standards for Construction of Electric Plants and Electric Lines) Regulations shall be made for suitable oil soak pit and where use of</p>	<p>b)provisions shall be made for suitable oil soak pit and where use of more than 9000 liters of O-class oil in any one oil tank, receptacle or chamber is involved, provision shall be made for</p>	

		<p>more than 9000 liters of oil in any one oil tank, receptacle or chamber is involved, provision shall be made for draining away or removal of any oil which may leak or escape from tank, receptacle or chamber containing the same, and special precautions shall be taken to prevent the spread of any fire resulting from ignition of the oil from any cause and adequate provision shall be made for extinguishing any fire which may occur</p>	<p>draining away or removal of any oil which may leak or escape from tank, receptacle or chamber containing the same, and special precautions shall be taken to prevent the spread of any fire resulting from ignition of the oil from any cause and adequate provision shall be made for extinguishing any fire which may occur. In substations or a switching station with K-class fluid filled apparatus having more than 9000 liters of oil, station can be located in basement with simple arrangement for soak pit and drain system (upto 25% of oil quantity). Minimal fire extinguishing arrangements can be provided for the protection of other equipments, accessories etc.</p>	
	44.2.vii.d	<p>d)all transformers and switchgears shall be maintained in accordance with the maintenance schedules prepared in accordance with relevant codes of practice of Bureau of Indian Standards</p>	<p>d)all transformers and switchgears shall be maintained in accordance with the maintenance schedules prepared in accordance with relevant codes of practice of Bureau of Indian Standards or relevant IEC /IEEE in the absence of IS .</p>	

	44.2.vii.e	e)dry type of transformers only shall be used for installations inside the residential and commercial buildings	dry type transformers or sealed type K Class fluid filled transformers only shall be used for installations inside the residential and commercial buildings as per IEC 61396-1:2010 or latest editions	
	44.2.ix	he shall ensure that the transformers of 10 MVA and above rating are provided with Automatic High Velocity Water Spray System designed and installed as per IS 15325 or with Nitrogen Injection Fire Protection system	he shall ensure that the transformers of 10 MVA and above rating are provided with Automatic High Velocity Water Spray System designed and installed as per IS 15325 or with Nitrogen Injection Fire Protection system except for transformers filled with K-class fluids;	
	44.2.x.g	oil filled transformers installed indoors in other than residential or commercial buildings are placed not below the first basement;	O-class oil filled transformers installed indoors in other than residential or commercial buildings are placed not below the first basement;	
	44.2.xi (a)	he shall ensure that oil filled transformers installed indoors in other than residential or commercial buildings are placed not above the ground floor	he shall ensure that O-class oil filled transformers installed indoors in other than residential or commercial buildings are placed not above the ground floor	
	44.2.xi (b)	he shall ensure that K-class oil filled transformer are placed not above the first floor of utility building provided the building structure is sufficiently strong;	he shall ensure that K-class oil filled transformer are placed provided the building structure is sufficiently strong;	

<p>TORRENT POWER</p>	<p>44.2.ix</p>	<p>He shall ensure that the transformers of 10MVA and above rating shall be provided with Automatic High Velocity Water Spray system designed and installed as per IS 15325 or with Nitrogen Injection Fire Protection system</p>	<p>In Addition to Existing Provision, for transformers with K Class Filled Fluids, fire safety requirements as mentioned in the International standards shall be adopted</p>	<p>As a result of the Fire Point of K Class Fluids being greater than 300 Deg Centigrade in comparison to 160 Deg Centigrade of Mineral Oil, the chances of fire due to equipment failure or its component or otherwise is ruled out hence no specific arrangement like Automatic High Velocity Water Spray system or Nitrogen Injection Fire Protection system is required.</p>
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