



CEEAMA E-NEWS

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Volume 2 Issue# 8

Electrical Consultants' Newsletter

August 2018

From the President's Desk



Dear All,

It is indeed a great pleasure to meet you all again through this page.

Wish you all Happy Independence day.

Though the interaction amongst CEEAMA members is increasing and we

are getting appreciation on the new execution style of CEEAMA, I personally feel that it is a long way to go. I, on behalf of Governing Council, again request all the members of CEEAMA to take active participation in all the events with good interaction and healthy discussions and to make CEEAMA more vibrant.

In line with main objective of knowledge sharing presently we are concentrating on the issues related to Solar Energy, Energy Conservation and Safety.

Though there are very few, who are constantly contributing to CEEAMA-E-News, like Mr. Mangesh Shirgaonkar. We wish, in future issues, many new members will add value through active contribution, so that we are "Always One Step Ahead".

With an energetic Governing Council, We are confident that we will be delivering and keeping up all our promises to raise CEEAMA to a raised platform.

We are looking forward for active participation from all members to strengthen CEEAMA. In absence of any concrete suggestions from our members, we at GC set few goals and take path forward. We request all of you to give one suggestion which will make CEEAMA little vibrant and will show its presence in the Industry.

We are putting great efforts to increase CEEAMA presence by conducting CEEAMATECH-2019 – an exhibition at Pune. All of you are requested to strengthen CEEAMA through active participation in CEEAMATECH-2019. Please get in touch with Mr. Keskar or myself with your suggestions .

With warm regards,

Anil Bhandari

Hon. President

CEEAMA

What is New?

Eaton introduces cutting-edge technologies to enable power infrastructure modernization in India

Power management company Eaton on 12.03.2018 announced the introduction of a range of cutting-edge power distribution products at Elecrama 2018 – reiterating its commitment to India's power infrastructure modernization efforts. The products launched at the event include:

- Eaton's RVAC SF6 Ring Main Unit (RMU): With advanced safety and ergonomically designed features The RVAC RMU is smart grid ready and immensely improves ease of operation and user experience. A highly compact design with logical mechanical and electrical interlocks improves personal safety and makes fault detection easy and quick.
- Eaton's VS1 Vacuum Circuit Breaker (VCB): A medium voltage breaker the VS1 VCB operates on mature spring operation mechanism adopting Eaton VI technology. It is highly reliable, provides operational convenience, long life and easy maintenance.
- Eaton's PSL series Air Circuit Breakers (ACB): The highly reliable PSL series delivers performance without compromise as it comes with a very high arc handling capacity. The PSL is operates with a special grease to work for low temperature (up to -40 C). PSL ACBs offers excellent mechanical and insulation capability, enhanced product and electrical lifecycle and highly reduced bounce.



Contributed By Mangesh Shirgaonkar

In This Issue...

What is New? : Eaton introduces cutting-edge technologies to enable power infrastructure modernization in India

Circular : BIS 1180 Notification

Article : Life Expectancy of Capacitors

Article

Life Expectancy of Capacitors

The prime component and vulnerable component in reactive power compensation (or power factor improvement) is Capacitor.

One must know about the life expectancy of Capacitors and the factors that affect the life span of capacitors (other than the basic quality of the capacitor).

How can the capacitor life time be prolonged?

The mean life expectancy is defined as “the average time up to which useful service of a device is expected under the conditions specified by the manufacturer and the relevant (international) standards” The point is that these specifications are often not respected. Main stress parameters for the capacitors are all values that exceeds the specifications by the manufacturer, for example in terms of temperature, switching operations and applied voltage.

We shall see these factors one by one.

Aging factor 1: Temperature

In most of the applications capacitors are used inside the panel/cabinet, mainly with the front door closed. Even if only the capacitors were in side the panel, they would already have an influence on the surrounding temperature as they heat up during operation. Additionally, there are other components that lead to a temperature increase: Harmonic filter reactors, bus bars and thyristors heat up, delivering this heat to the inside of the cabinet. To keep the temperature at the non-hazardous level, a proper cooling by fans is recommended. Also, a low temperature of the location where the cabinet is placed helps – preferably both ways of cooling. Like in a Sauna, the hottest part will always be at the top. Therefore the capacitor themselves should always be installed at the bottom. Also, especially filter reactors that heat up during operation should be placed in a distance as big as possible. The “ideal” temperature is < 35° C for capacitors (see temperature class specified by IEC 60831-1)

Following formula gives an estimation how the life time of a capacitor is influenced by the surrounding temperature.

$$TAV = \lambda \times T$$

where, TAV = average life expectancy, λ = factor by which the life of capacitor gets affected, T = ideal life span

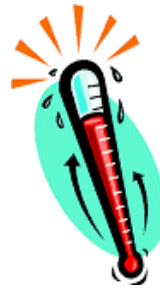
The experience and experiments give the estimated value of ' λ ' as below

at 42 °C $\lambda = 0.50$

at 35 °C $\lambda = 1.00$

at 28 °C $\lambda = 2.00$

This means if the capacitor is exposed to the temperature of only 42 °C i.e 7 °C higher than the ideal 35 °C, the life expectancy will be halved....50,000 hours instead of 100,000 hours. And as the question here is “how to prolong” and not “how to shorten” the life time: a temperature of 28 °C i.e 7 °C below the ideal 35 °C the life expectancy shall be 200,000 Hrs; against 100,000Hrs.



Always keep an eye on the temperature

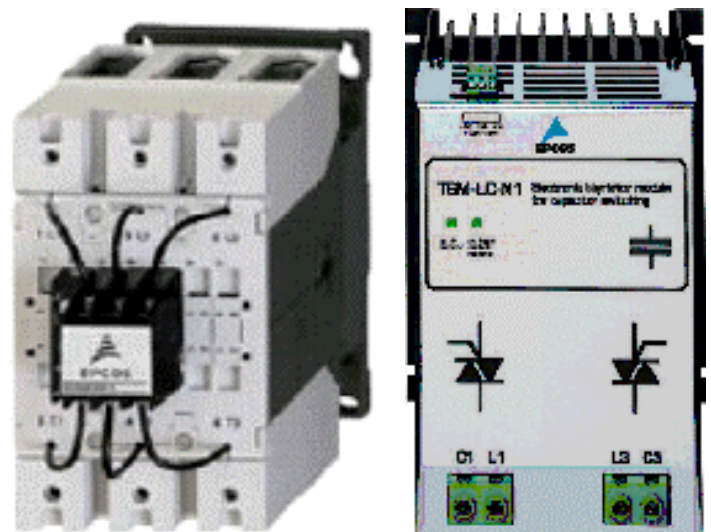
Aging factor 2 : The number of switching operations

When a light bulb fails, this mainly happens while switching it on & off. That means the switching operation has a stress on it. The same applies to a capacitor. To keep this stress as low as possible, the usage of appropriate switching device is highly recommended.

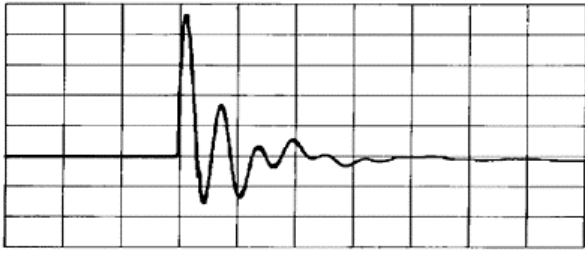
Most common switching devices are electromechanical capacitor duty contactors or electronic thyristor modules. Before choosing the one or the other, the expected number of switching operations, the type of load—slow or fast changing(varying)—and the number of step has to be defined.

When switching a capacitor, it is burdened with high inrush current for a very short duration or for the duration of 20 to 40 msec. The inrush current is the transient current that occurs for very short time exactly at the moment of switching. Even though it is only a matter of a jiffy, there will be high inrush current > 1000 A.

Capacitor duty contactors are devices for capacitor switching and additionally they have auxiliary contacts with damping resistor for damping of inrush currents. These auxiliary contacts and damping resistor automatically goes out of circuit once main contacts are on. Capacitor duty contactor can be used in the applications where only slow changing loads are present and where no fast re-switching is required. If ordinary/power contactors are used for this type of switching, the large current peaks quickly strip out the material that the manufacturer add to the contact alloy to prevent contact welding. The result is that after only a few hundred switching operations, pure silver is all that remains and the contacts definitely weld.



Capacitor duty Contactor Thyristor Switching Module (TSM)



Switching with Normal Contactor

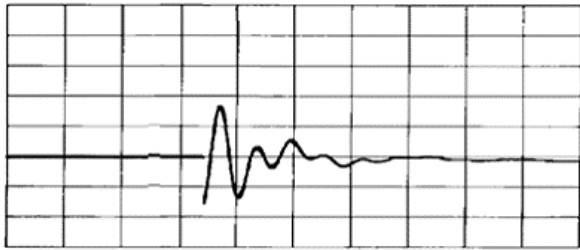


In so-called “dynamic” application – fast changing load where fast reaction time & more switching is needed – thyristor module are the appropriate device. They feature helps to switch in at the zero point of the voltage so there will be neither excess voltage nor current on the capacitor.

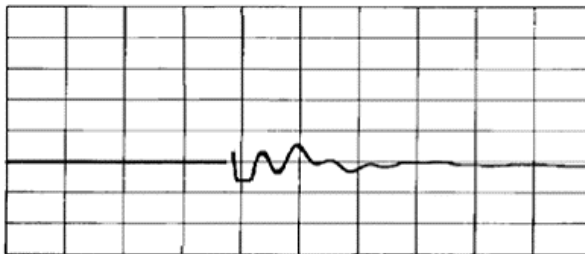
Both switching devices will protect capacitors from the harmful effects of inrush current. Thyristor modules allow almost unlimited operations.

So, to prolong the life time of a capacitor, either a capacitor duty Contactor or Thyristor module is recommended.

That is why IEC 60947 define separate AC-6b utilization category for Switching of Capacitor banks



Switching with Capacitor Duty Contactor



Switching With thyristor switching module



Prepared by:

Rushikesh R.Rajdhar.

Business Development

Aluminum and Film Capacitors Business Group

EPCOS India Private Limited

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Our Main Purpose to bring all consulting electrical engineering professionals on one platform.
Knowledge and Experience sharing
Exposure of members to latest Codes and Practices

OUR PRESENCE:

Mumbai, Pune, Satara, Sangli, Nashik, Miraj, Kolhapur, Aurangabad, and Nagpur and Intends to expand its operations and activities in different regions outside Maharashtra in the coming days.

CEEAMATM

Consulting Electrical Engineers
Association of Maharashtra

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- Factory Visits

350+ MEMBERS

with three major categories:

- Life Fellow Member
- Patron Member
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For more details Kindly Contact: Admin@ceeama.org or Visit www.ceeama.org

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विशाखाबाग, सांगली.
आयक नं. : 7873
दिनांक : 16 SEP 2016
सा.प्र./तारीख/लेखा

MAHAVITARAN
Maharashtra State Electricity Distribution Co. Ltd.

A Govt. of Maharashtra Undertaking
CIN : U40109MH2005SGC153465

Phon: (O):26474211 /26472131
Fax: 91 22 26473429
Website: www.mahadiscom.in
E-mail: cestores@mahadiscom.in
Cestores1@gmail.com

Material Management Cell
Vth Floor, Prakashgad,
Prof Anant Kane car Marg,
Bandra (East), Mumbai - 400051

No: CE /MMC/MSC/Dist. TF/

002848

Date:

24 AUG 2016

To,
All Superintending Engineers
MSEDCL, O&M Circles

Sub:- Implementation of IS 1180 (Part -1) 2014 and mandatory BIS certificate & standard mark on Dist. Transformers up to 2500 Kva.....Corrigendum thereof.
Ref : 1. Lr No.: CE/MMC/MSC/dist. T/F/BIS/1034 dated 02.04.2016.

Please refer to the cited subject and reference thereof. Accordingly it is to clarify that the instructions /guidelines issued vide the aforesaid letter referred above are applicable for procurement of Distribution Transformers by Material Management Cell only. As such these guidelines issued are not applicable for ongoing schemes such as Infra Plan, RAPDRP, Special Ag Programme, DDF, IPDC, etc and separate guidelines shall be issued for the said schemes / works if any by Competent Authorities viz. Chief Engineer (Infra Plan), IPDS, Distribution etc.


Chief Engineer

Copy swrs to:

Director (Operations)/ Director (Projects) Director(Finance),MSEDCL, Mumbai.
ED (Dist-II)/ED(Dist-I/Commercial)/ ED(Dist-III/Infra) ED(Dist-IV/Projects),MSEDCL,Mumbai
Copy fwcs to
All Zonal Chief Engineers
Copy to
OSD to Hon. CMD,MSEDCL,Prakashgad, Mumbai

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Dy. Ex. Engineer	
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CCCC	Intra
Q.C.	R
S/s	G
LDC	





MAHARASHTRA STATE ELECTRICITY DISTRIBUTION CO. LTD.
TESTING DIVISION, SANGLI

Email : eetsangli@mahadiscom.in

Phone : (0233) 2301744 (O) 2303280 (P)

No. EET/SANGLI/Tech/

No 14934

Date:- 19 JUL 2016

To,

The Superintending Engineer,
MSEDCL, O&M Circle Office
Sangli.

Sub:- Implementation of IS 1180 (Part I) : 2014 & mandatory BIS Certificate & standard Mark on Distribution Transformers upto 2500 KVA

- Ref:- 1) CE/MMC/MSC/Tech/Dist T/F/BIS/1034 date 02.04.2016
2) Ministry of Heavy industries and Public Enterprises Office memorandum no. 5(2)/2009- PE(Vol II) date 01.03.2016
3) CE/MMC/MSC/Dist T/DDF/003659 Dt 10/09/2015

With reference to above correspondence, directives are received from higher offices regarding implementation of IS 1180(Part I):2014 in respect of distribution Transformers to be utilized in our system from 01.08.2016.

The revised IS covers both sealed and non sealed type distribution transformers upto 2500 KVA and nominal voltage up to 33 KV and also single phase sealed type distribution transformers upto 25 KVA .

Moreover distribution transformers have been grouped under three different categories namely 'Energy Efficiency Level 1, Level 2 and Level 3' based on the maximum total losses.

In view of this, it is kindly requested to take up matter at your level to incorporate condition in the estimate sanction letter as,

'Transformer to be utilized should be BIS marked, certified and as per IS 1180(Part I):2014. The manufacturer should be either from approved vendor list of Corporate Office or should have obtained approved GTP and drawing with valid type tests from O & M Circle Office Sangli in accordance with IS 1180(Part I).

Copy of letter from Chief Engineer, MM cell, HO is enclosed for ready reference.

The revised date of implementation is from 01/08/2016. Hence onward testing of transformers will be carried out only as per IS 1180(Part-1):2014 from 1/08/2016.

Submitted for information and further necessary action please.

Enclosed :As above

Handwritten signature/initials

Executive Engineer(T)
Testing Division Sangli

Copy s.w.r.s.to: The Superintending Engineer (TQA), Pune.

...for information please.

Copy f.w.c.to:

The Executive Engineer , O & M Division Offices Sangli (U)/Sangli(R)/Vita/Islampur/KMahankal
....for information and necessary action please.

(3)

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Prof. A K Marg, Banira (East),
Mumbai - 400 051.

CE/MMC/MSC/Tech/Dist. T/F/BIS/001034

Date 2 APR 2016

To,
All Superintending Engineers,
O & M Circle
MSEDCL

Sub: Implementation of IS 1180(Part I):2014 and mandatory BIS certificate and Standard Mark on Distribution Transformer upto 2500KVA.

Ref:

- 1) Ministry of Heavy Industries and Public Enterprises office memorandum no. 5(2)/2009-PE-XI(Vol.III) dtd. 1.03.16.
- 2) Ministry of Heavy Industries & Public Enterprise Memorandum No. F.No.5(2)/2009-PE-XI(Vol.II) dtd. 7.08.2015.
- 3) Ministry of Heavy Industries & Public Enterprise notification of Electrical Transformers (Quality Control) order, 2015 dtd. 7.05.2015.
- 4) IS 1180(Part I):2014.
- 5) CE/MMC/MSC/Dist. T/F/DDF/3659 dtd. 10.09.2015.
- 6) Approval Office note Dir(Op)/O.N./O.W/942 dtd. 21.03.2016.

In connection with above referred subject, MSEDCL is procuring and utilizing the conventional type of Distribution Transformers as per IS 2026:1997 and IS 1180(Part I & II) amended upto date. Recently Bureau of Indian Standard has published revised standard (IS 1180 Part I:2014) for outdoor type oil immersed Distribution Transformers upto and including

2500KVA, 33KV for level 1 , level 2 and level 3 Distribution Transformers. This revised IS amalgamates IS 1180 (Part 1):1989 and IS 1180(Part 2):1989. This version of IS 1180 (Part 1:2014) is applicable from 19.07.2014.

This revised IS covers both sealed and non-sealed type distribution transformers upto 2500KVA and nominal system voltage upto and including 33KV and also single phase sealed type distribution transformer upto 25KVA rating and nominal system voltage upto and including 33KV. Moreover, in this revised version, the distribution transformers have been grouped under three different categories namely ---'Energy Efficiency Level 1', 'Energy Efficiency Level 2' and 'Energy Efficiency Level 3' based on the maximum total loss.

As per the guidelines of Ministry of Heavy Industries and Public Enterprises order under ref. 3 dtd. 7.05.2015 -the manufacturer shall obtain valid License for use of Standard Mark within six months. This order was supposed to be effective from 1.08.2015. This order was again revised vide memorandum under ref. 2 dtd. 7.08.2015 and the effective date were modified to 1.02.2016.

In view of above, all the distribution transformers to be procured and utilized shall be BIS marked and BEE certified effective from 1.02.2016 as per Ministry of Heavy Industries & Public Enterprise Memorandum under ref. 2.

Now again this order has been revised vide memorandum under ref. 1 dtd. 1.03.16 and the effective date modified to 1.08.2016, provided the purchase order is prior to 7.05.2015.

Hence the distribution transformer to be utilized in the MSEDCL network shall be BIS marked and BEE certified.

Vide letter no. CE/MMC/MSD/Dist. T/F/DDF/3659 dtd. 10.09.2015 Competent Authority has re-delegated powers to S.E. (O & M) Circle, for approval of GTP and type test for the Distribution Transformer to be utilized under DDF, DPDC, SPA and other schemes.

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In view of above, all are requested to take note of directives to utilize distribution transformer as per amendment, i.e. as per Ministry of Heavy Industries and Public Enterprises Memorandum under ref.1-3, for the various schemes such as DDF, DPC, SPA and other schemes.

Encl:-All office memorandum under ref. 1-3.


(B. B. Gadgil)
Chief Engineer (MMCell)

Copy s.w.rs.to:-

- 1) The Director (Operations)/ (Projects) / (Finance), MSEDCL, Corporate Office, Mumbai.
- 2) The Executive Director (Infra)/ (Comm.) / (Distribution), MSEDCL, Corporate Office, Mumbai.

Copy s.w.cs.to:-

- 1) The Chief Engineer (Infra) / (APDRP), MSEDCL, Corporate Office, Mumbai. -
--The amendments are also applicable for Infra & RAPDRP project schemes.
- 2) The Chief Engineer (Distribution / Testing), MSEDCL, Corporate Office, Mumbai.
- 3) All Zonal Chief Engineers, O & M Zone, MSEDCL.

Maha
A GOVT. OF MAHARASHTRA UNDERTAKING
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Fax: 91 22 26473429
Email :cestores@mahadiscom.in
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Ref No. CE/MMC Gr.XII/

Material Management Cell,
1st Floor, Prakashgad,
Prof Anant Kanekar Marg,
Bandra (East) Mumbai - 400 51
Date: 23 FEB 2017

000604

To,

All Superintending Engineer

(O&M) Circle

MSEDCL

Sub.: Purchase of Level-1 Distribution Transformer as per IS-1180(part-1):2014 against order placed under Infra. Ag turnkey, special package-II, including DDF scheme.

Ref.: i) L. No. CE/MMC/MSG/Tech/ Dist. 1 /BIS 0010/34 dtd 02.04.2016
ii) Gazette Notification Dtd 16/12/2016 of Ministry of Power
iii) Gazette Notification Dtd 17/02/2017 of Ministry of Power
iv) Proposal approved vide ON no CE/MMC/1434 dtd 22.12.2017

With reference to above cited subject, it is to state that in the past, MSEDCL was procuring various ratings of Dist Transformers as per IS:1180 (Part I and Part II):1989. As per Gazette Notification of Ministry of consumer affairs Food and public distribution dtd 19.07.2014 the IS:1180 (Part I and Part-II) :1989 is cancelled and IS:1180 (Part I) :2014 is enforced from 01.02.2016. Further as per Gazette Notification of Ministry of heavy Industries & Public enterprises, Govt of India on dtd 07.08.2015, it is mandatory to procure energy efficient transformers of Level 1, 2, 3 as per IS:1180 (Part I) :2014 with BIS certification mark & all field officers are informed accordingly vide letter under reference no (i)

Further, it is observed that MSEDCL field offices, has placed orders for energy efficient level-1 transformers in various schemes like Infra. Ag turnkey, special package-II etc including DDF scheme. The supply of Dist transformers against these orders placed in the above mentioned schemes, are in hold due to new gazette notification issued by Ministry of Power, dtd 16.12.2016, in which energy efficient transformers Level 1, of IS:1180 (Part I) :2014 is removed and energy efficient transformers of Level-2, Level-3 are re-designated as Star-1 and Star-2. Transformer loss level for Star 1,2,3,4,5 indicated in the above said gazette notification are effective from 01.01.2017.

LE (o)
follow up
27/2/17

Due to the notification of DII dtd 07.05.2015 and Ministry of Power dtd 16.11.2016, it was very difficult for supplier as well as MSEDCI, that which gazette notification was to be followed. Hence MSEDCI requested DII as well as Ministry of power for clarification and guidelines in this regards.

Now Ministry of Power vide Gazette Notification dtd 17.02.2017 has extended the date to accept-purchase the Dist Transformers of energy efficient level-1 as per IS:1180 (Part I) 2014 upto 30.06.2017. From 01.07.2017 Dist transformers with Energy Efficient Level-2 / Star-1 shall be accepted/ procured under any scheme.

In view of above gazette notification issued by Ministry of Power dtd.17-02-2017, MSEDCI may purchase / allow Level-1 Energy Efficient Distribution Transformer of as per IS-1180 (part-1): 2014 against order placed under Infra. Ag turnkey, Special package-II etc including DIF scheme (all schemes) in MSEDCI till 30th June 2017.


Chief Engineer (M.M.Cell)

Copy s.w.rs. to :

- 1) Director (Operations/Projects/Finance), MSEDCI, Prakashgad, Mumbai
- 2) Regional Director, (Nagpur / Aurangabad / Pune / Kokan) Region, MSEDCI.
- 3) Executive Director (Dist.I/II/III/IV) , MSEDCI, Prakashgad, Mumbai.

Copy f.w.cs. to :

- 1) All Chief Engineer (Zone) , MSEDCI.
- 2) Chief Engineer (Infra/IPDS), MSEDCI, Prakashgad, Mumbai

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