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**Vigilance and
commitment to
excellence...that's
the mantra!**

FROM THE ED's DESK

My dear friends,

Events of the last few weeks have demonstrated the rot that has set into our system and ethos, leaving no arms of the country unaffected.

Cables, by design, have a life that runs into decades. These are often installed underground in cities. The cost of replacing these cables will be at least 10 times more at that time. It is for this reason that enlightened organisations are willing to pay premium to get "Top of the Line" quality today.

Advanced countries have adapted certain standards for cable design and manufacture which are followed by manufacturers in letter and spirit. It is high time that the cable industry too regulates itself instead of falling prey to temptations of making a fast buck at the cost of the customer and indeed the country whose infrastructure we are creating.

I urge all our customers and industry to remain vigilant while making long term investments.

Sincerely,

Nikhil Gupta

*We wish all
our readers a
very Happy
and
a Prosperous
New Year!*



WATER PENETRATION IN CABLES (3.3 TO 33 KV) PRESENT SCENARIO AND RECOMMENDATIONS

Over the last decade, the increase in demand of electrical power has led to phenomenal demand for power cables.

Utilities and users all over India are trying to cope up with this demand in two ways

- by optimising the use of their existing network of cables and
- by fast tracking the procurement of new cables.

For most utilities and users premature failure of existing cables have emerged as one of the key pain areas. Investigations have revealed two main reasons for these failures:

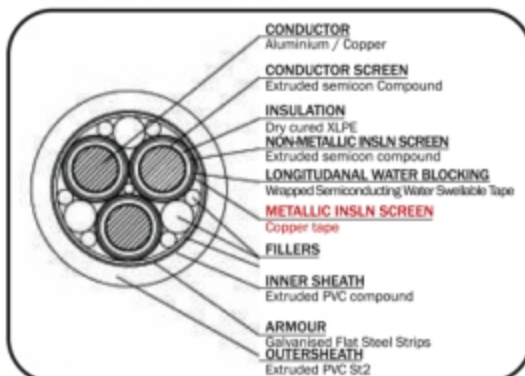
- ingress of moisture/water in cable and
- improper joints and terminations.

The ingress of moisture and subsequent failure can be addressed in following ways:

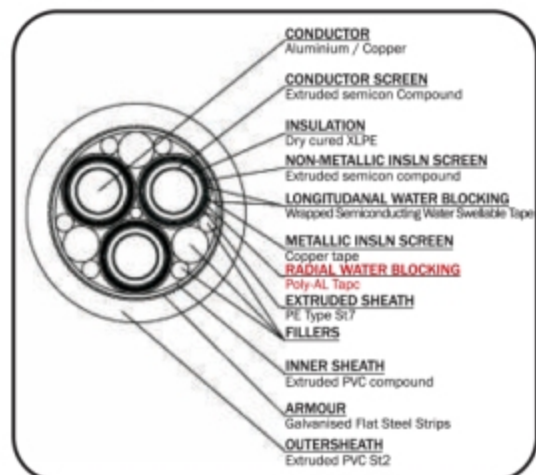
- by avoiding damage of outer surface of cables and
- by developing/designing parameters to avoid propagation of water along the length of cable by restricting the water at the point of penetration.

Many utilities and users are incorporating various features in their own constructional specifications of cables to tide over the problem of water propagation along the length of cable. These include the following measures:

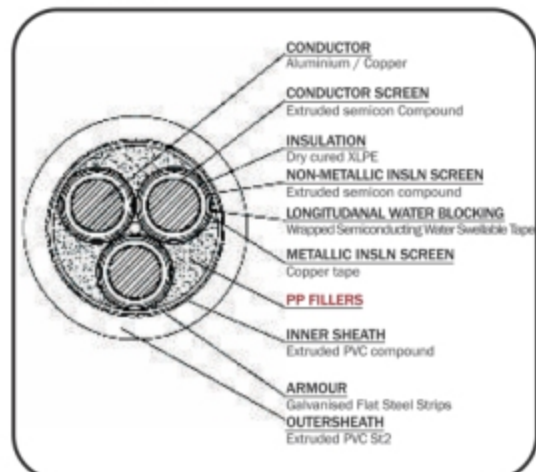
1. Incorporation of semi-conducting water swellable tape below copper tape on individual insulated core of multicore armoured cable.



2. Provision of polyethylene aluminum (Poly Al) tape over copper tape on individual insulated cores.

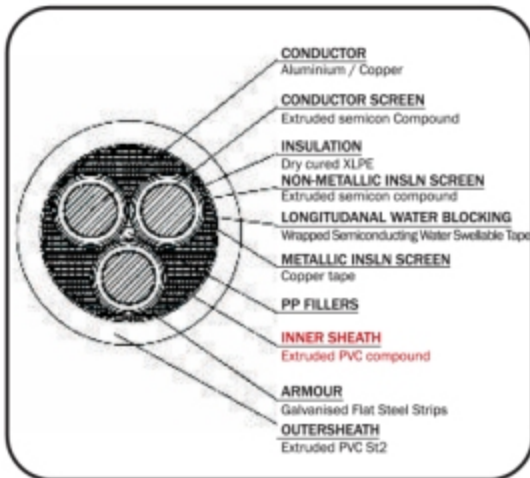


3. Incorporation of polypropylene fillers in the interstices of the cable.

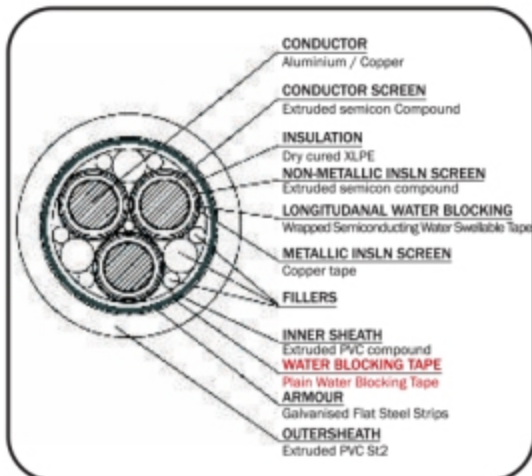




4. Provision of pressure extruded inner sheath.



5. Provision of a layer of water swellable tape below armour.



6. Increased insulation thickness and inner sheath thickness over and above the specified values in relevant Standards.

Practically, all above mentioned measures do not tackle the problem of water propagation along the cable even to the desired level.

To overcome the problem of water propagation, the root cause of water entering into cable needs to be attacked. In most cases, water enters from the damaged outer surface of the cable. Hence, it is necessary to have tougher outer sheath like polyethylene type ST 7 (as per IEC: 60502-2), which has better physical properties than PVC. At the same time sheath integrity and non-existence of pinholes on outer sheath should be ensured at the time of processing.

Additionally, following features can be added to overcome this problem

- conductor construction can be water tight type.
- lead sheath can be provided as metallic barrier
- water swellable tape in different layers of cable construction.

All of the additional features will make the cable costlier. The user has to decide the right features considering the installation conditions, gravity of situation and economics.

For further details or discussion on the subject, please do write to us at sanyalb@kecrpg.com
Tel.No. 022 2173 1704.



INNOVATION @ RPG CABLES

Recently we received a request from our customer to investigate why most of the cables laid at their plant started failing one after another. In all the cases, the outer sheaths of the cables were externally damaged, armour wires were rusted/broken and the insulated cores were damaged resulting in cable failure. They requested our team to investigate the reason and to come out with definite solutions.

As Customer Care has always been our top most priority, our Tech Team was more than happy to collate data, investigate and do the needful research and give the needed directions.

The Team started with an unbiased and a Quality tools approach. As a part of the secondary data collection, they gathered all the information that centered on the Cable failing instances in the history of RPG Cables as well as the Cable's industry in general. After the preliminary investigation of these instances they deciphered few common observations, as below:

- All the failure patterns were similar in nature.
- Incidentally, all the damaged cables were PVC sheathed cables.
- No mechanical damage observed.
- Gradual increase of outer sheath damages.
- Most of the failed cables were PVC insulated.

Thorough investigation from the photographs and discussions within our tech team, revealed that in all the cases, cables were exposed and came in contact with MIBK (Methyl Isobutyl Ketone). MIBK is very corrosive and a strong solvent of PVC. So whenever PVC outer sheath and insulation came in contact with MIBK, it absorbed MIBK and gradually dissolved in it, resulting in failure of the cable.

With further deliberation, the team deduced and recommended the use of PE or LSOH as outer sheath for all those cables which are expected to come in contact with MIBK. In the light of this we formulated a test procedure for the same. In the test they exposed PVC (typeST2), PE (typeST7) and LSOH samples separately to liquid MIBK for few months. While PVC started dissolving in MIBK within a couple of days, PE and LSOH samples remained unaffected. To validate the deductions, they invited few senior executives from our customer base for their valuable expertise and reviews. Having got their consensus, a draft method of test has now been prepared, which would further get customized and modified to the technical specifications of the LT cables provided by the various customers.

It is an enriching experience to cater to such demands of the customers which results in significant innovation, thus providing mutual benefit to all the stakeholders in the industry. We at RPG Cables have taken and will always take pride in bringing about the paradigm shifts in the industry!





CABLES DESIGN FUNDAMENTALS... CONTD

In the previous issues of C2C (September'2010), we had covered this subject in some detail. If you have missed this issue, do write to us for your copy.

VOLTAGE GRADE

The design voltages for cables are expressed in the form U_0/U . U_0 is the power frequency voltage between conductor and earth and U is the power frequency voltage between phase conductors for which the cable is designed. U_0 and U both are r.m.s. values.

Power cables in Indian Standards are thus designated as 660/1100V, 1.9/3.3KV, 3.8/6.6KV, 6.35/11KV, 12.7/22KV and 19/33 KV. Generally, for higher transmission voltages, it is a practice to mention only the value of U like 66 KV, 132 KV, 220 KV and 440KV.

Usually, the distribution voltages are low voltages, hence, the cables are designed based on their installation conditions to suit more for mechanical rather than electrical parameters.

Generally, the cables are categorised as low voltage (LV), medium voltage (MV), high voltage (HV) and extra high voltage (EHV).

CONDUCTOR RESISTANCE

Conductor material resistivity and purity are the main factors which can affect the conductor resistance. The current flows helically along the individual wires in the conductor. Hence to calculate the resistance of stranded conductor, a factor is applied for the linear length of wire in the conductor to allow for extra length caused by the stranding effect. In a multicore cable an additional factor is applied for the additional length due to the lay of the cores.

If a conductor is carrying high current, the distribution of current is not evenly spread throughout the cross-section of the conductor due to 'skin effect' and 'proximity effect'. As a result of these effects, the current density is less at the centre of a conductor than at the conductor surface and it results in an increase in the effective resistance of the conductor.

The magnitude of the skin effect is influenced by the frequency, the size of the conductor, the amount of current flowing and the diameter of the conductor.

The proximity effect also increases the effective resistance due to the magnetic fields of two conductors which are close to each other. The proximity effect decreases with increase in spacing between cables.

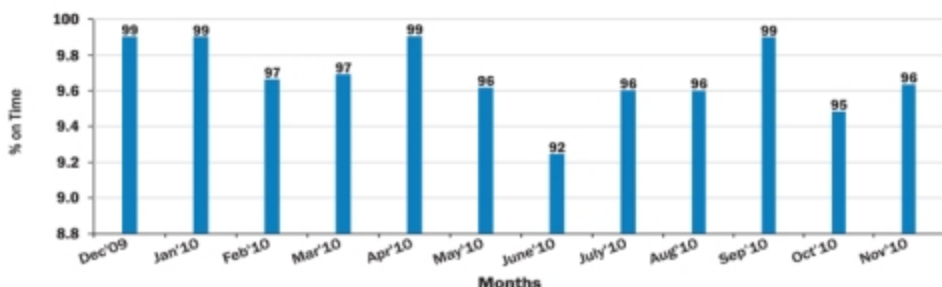
Skin and proximity effects may not be so significant with small conductors carrying low currents. These become increasingly significant with larger size conductors and it is often desirable for technical and economic reasons to design the conductor with segmentation. Conductor resistance is important for calculation of current carrying capacity.

INDUCTANCE, REACTANCE and IMPEDANCE are also important in designing of cable and are calculated with basic electrical engineering formulas.

Keep watch on the space!

Ref: BICC Handbook

Delivery Rating Index (DRI)





Mr. Nikhil Gupta (C) & Mr. George Verghese (L) receiving the award



The Winning Team!

FROM THE NEWS DESK

WELCOME ON BOARD

RPG Cables having successfully completed the merger with KEC International Ltd has now restructured its business keeping in mind the future strategies and the market demands. With an order booking of over Rs.6000 crs, KEC International has now divided its various SBU's between two main verticals - Distribution and Transmission, with Distribution Business comprising of Cables, Power systems and Telecom business. To lead the Distribution Business Mr. George Verghese (depicted in the picture above) has been appointed President. Mr. Varghese, 48 is a seasoned professional with over 26 years of experience in leading Corporates in Paint, Engineering, Media and Telecom industry. Last eight years he was with Reliance Communications during which he grew to the position of President and CEO of Enterprise Business.

It also gives us pleasure to have on board with us our new sales team members @ Cables SBU.

Mr. Uday Ghose has over 25 years of rich industry experience. He will be responsible for all the end to end product / cable pricing. He can be contacted at ghoseuk@kecrpg.com and tinkled on 09930980158.

Mr. Santosh Menon comes with an expertise of over 25 years. He will be looking after the export business. He can be contacted at menons@kecrpg.com and 09819496490.

We wish them success in their new roles.



Mr. Santosh Menon



Mr. Uday Ghose

QUALITY.....AT ITS BEST! CABLES WINS THE BEST TQM AWARD FOR 2009-10

Another laurel added to the Team Cable's bag, when the team won the prestigious 'Best TQM Team Award', among 10 representatives from different companies. TQM has always been a beacon for Cable'ites and this win acknowledges the continual efforts and hard work put in by Team Cables in making the whole TQM movement a success. The last few years have really been rewarding for the TQM movement at Cables which has gained real momentum as is quite evident through the significant rise in the number of CFTs every year.

New topics have been picked up for CFT formation, not only at the Unit level, but at the corporate level too, ensuring 100% involvement of employees at all levels. At Cables, we know that it's not just talking theory but actual demonstration that makes a big difference in making a shift in the mind sets of people. Today, people are so encouraged with the successes of CFTs that they themselves want to get associated with some or the other CFT. One of the winner team members at Thane Unit says, "The taste of success is so encouraging that we would like to have ourselves more and more involved with CFT movement. It surely is reducing our day to day stresses and tensions!"

The benefit of CFTs would be in improving quality, productivity and systems as well as reducing scrap. All of these will ultimately benefit our customers by way of timely deliveries, better quality and reduced costs.

For additional information/details/queries and to subscribe to C2C please write to:

Mrs. Mayuri Mangaonkar Dhumale,

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OR E-mail to dhumalemr@kecrpg.com