Insulated Cross Arms from Modern Insulators Limited

The transmission line network in India is huge and lines of different kV ratings have been laid as per need of the power at the time of construction.

Subsequently the need for power is increasing and there is a need to transmit more power in the same corridor. However, On-going development of overhead power infrastructure faces key challenges these days from the perspectives of cost as well as Right of way (ROW) objections by a public that has grown wary of transmission lines. With more and more of urbanization, Transmission lines that were generally out of city boundaries are now inclusive. Needs of Infrastructure developments in such regions necessitates raising of existing conductors for maintaining necessary clearances at Road, Bridges, Bullet Train, Metro Rail, High speed corridor etc crossings.

While cable may offer a solution in terms of visual impact, it comes with a significant construction cost premium. Expanding the power transfer capacity of existing overhead lines is one solution and involves options such as re-conductoring or application of flexible AC transmission systems. Upgrading lines on existing corridors is also an option and can be achieved by modifying towers to handle higher voltages. Rebuilding lines on existing routes also requires planning consent, which depends on public approval – just as for new lines.

Considering all above, a high diversity of technical and innovative solutions – such as a compact line with insulated cross-arms is now seen as necessary to promote public acceptance and facilitate obtaining the necessary permits.

Modern Insulators Limited – Porcelain Long Rod Insulators (PLRI) with modified mounting arrangements:

MIL make Long Rod Porcelain Insulators as insulating cross-arms have been developed as part of a multi-year research and test program. These are intended to replace steel cross-arms and suspended vertical insulator strings on traditional lattice towers, thereby enabling conductors to be attached directly to the cross-arm.

What is Insulated Cross Arms?

Long Rod Porcelain Insulators used as a cross-arm on towers from Modern Insulators Limited replaces the traditional steel iron cross-arm. The other end is directly connected with the conductor with necessary lined up fittings, while traditional suspension insulators are totally cancelled and removed. Porcelain Long Rod Insulators are made of alumina porcelain and have a reasonably excellent comprehensive and tangential strength.

Whether mounting Insulated Cross Arms require any alteration in tower or tower foundation?

The answer is "No"

The scheme worked out by Modern does not require any change in existing tower or tower design. There is no reinforcement required at tower foundation. The existing tower can be used as it is.

How Long Rod Porcelain Insulators from Modern Insulators Limited are mounted on existing tower?

Modern have developed mounting arrangements in which existing tower cage shall be fitted with thicker metallic strips. Hinge clamp shall be mounted on the same. Porcelain Long Rod shall be connected to these clamps using clevis type end fittings. At another end yoke plate shall be used to connect horizontal and inclined members of Insulators.

How much conductor can be lifted by using Cross Arms?

Among the key benefits of PLRI cross-arms is that insulator swing under windy conditions is reduced to a minimum and instead determined by metal clamping assemblies. There is also no requirement for additional tower height to accommodate the length of the insulator string itself. Therefore, using PLRI cross-arms can effectively raise heights of conductors by this same distance.

Depending on the length of the insulators, roughly it would go up by:

66 kV - 870 mm

132 kV - 1260 mm

220 kV - 2050 mm

Basically, such a solution can:

1. Resolve ground clearance problems on existing lines
2. Allow greater sag on existing or new conductors, critical to improving power transfer capacity since it enables conductors to run at highest rated temperatures while still not infringing ground clearances
3. Facilitate voltage upgrading due to improved clearances from towers, especially since risk of blow out is mitigated

What is life of such arrangement?

This arrangement consists of Insulator and Hardware. Both these items are known to last for 40 years. Long Rod is a puncture proof Type A insulator as per IEC.

Along with enhancement in life, major potential benefits to transmission system users on existing lines include:

1. Retro-fitting towers, with no change in tower dimensions or profile, while allowing up to 150% more capacity due to increased ground and tower clearances
2. Increasing ground clearance so as to overcome any possible local infringement issues
3. Greater current carrying capacity of conductors due to increased allowable sag

How fast work of installation can be done?

Contractors have developed a flexible mounting platform that fits our Insulators. This safe method requires some adaptations that resulted in quicker installation time and eventually one cross-arm could be erected per hour. That covered one structure in about half a day, taking into account the time needed to shift from tower to tower.

What about type testing?

Offered Insulators and Hardware are type tested. They are standard products used in existing systems and are performing satisfactorily.

What is estimated cost of cross arms?

We request you to give following details to make our commercial offer

(a) Dimensional drawing of Cage of tower

(b) Dimensional drawing of Cross Arm of tower

(c) Type of existing conductor. If there is a plan to use a new conductor then details of the same.

Modern Insulators Limited

milabu@moderninsulators.com

Insulated Cross Arms Drawing